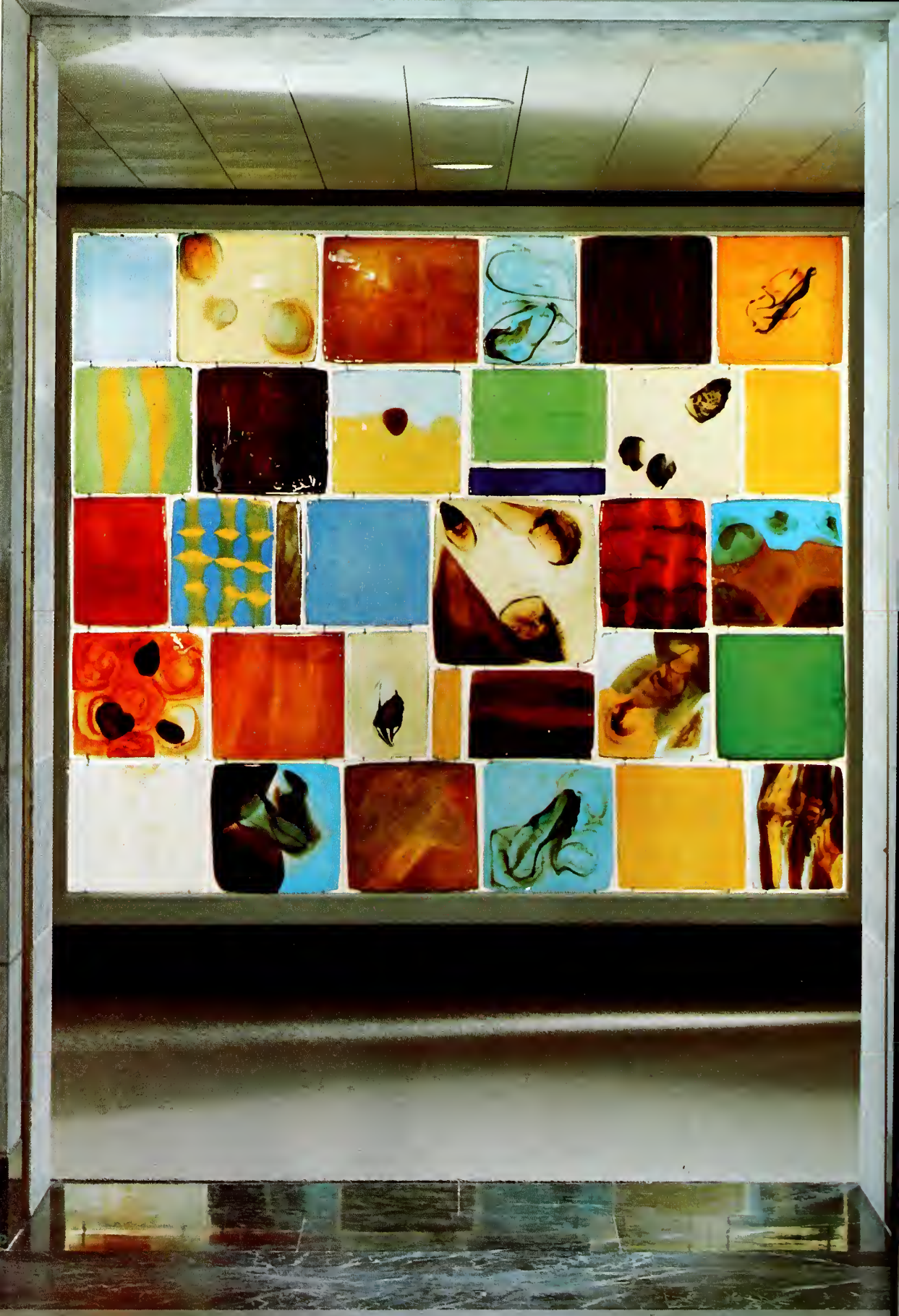
a guide to the glass collections

ART in GLASS

The Toledo Museum of Art

art in glass



ENTRANCE TO THE MUSEUM'S GLASS GALLERY. The unique monumental polychrome glass mural was executed especially for the Museum by Dominick Labino. Polychrome cast glass. 96¾ by 108⅜ inches. Gift of Mr. and Mrs. Dominick Labino, 1969.

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ACKNOWLEDGEMENTS

Vignettes in this Guide in sections other than those dealing in American and Modern glass have been taken from Denise Diderot, *Encyclopédie ou Dictionnaire Raissoné des Sciences des Arts et des Metiers,* Paris, 1751, 1762-65. 68.58. Gift of Urban E. Bowes, Perrysburg, Ohio.

The vignettes in the sections of this Guide dealing with American and Modern glass have been taken from Kate Field, *The Drama of Glass* printed by The Libbey Glass Company, Toledo, n.d., and now in the archival collection of the Museum. Gift of Mrs. Robert Roberts, Toledo, Ohio. Other details have been taken from glassware advertisements in the Archives of the Museum. Gift of Owens-Illinois, Inc.

Other vignettes are taken from decorative details of objects in the glass collections of the Museum.

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"The Art of Glass being one of the Most Noble and Curious of all other Arts, and the Wonderfulness of it, both in the Simplicity of the Matter, whereof it is made, and in the Formation of it; as also the various Colours it is capable of receiving, appearing so Curious and Entertaining, chiefly engaged my Thoughts in the Study of its Principles, and to penetrate into the most hidden Secrets of it."

The ART OF GLASS, H. Blancourt, translated from the French, London, 1699.

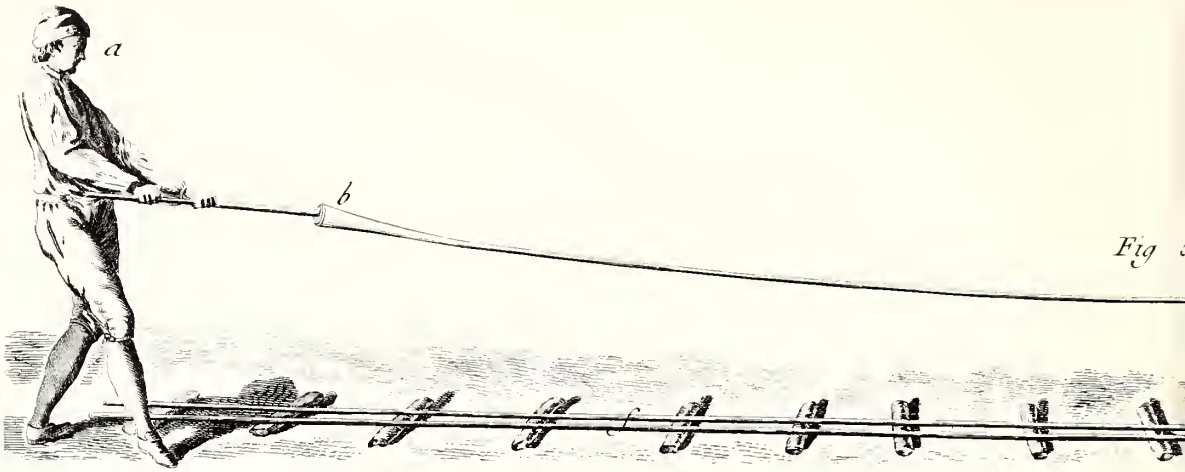
WHAT IS GLASS?

Glass is a hard, brittle, fragile material almost unique in that it is among the very few apparently solid materials which have no crystalline structure. It has been described as a "super-cooled liquid;" that is, a substance that has passed from a liquid into a rigid state without structural change. Glass occurs in a natural state as the volcanic substance, obsidian. The history of its artificial state (that is, man-made) goes back some 4000 years. Its origin is not known.

The delightful myth, as related by Pliny in his *Natural History*, that glass was first discovered accidentally by Syrian merchants who, while building a campfire on the shores of the Mediterranean, caused sand to be fused by heat, is of course only a romantic legend recorded by a Roman author almost 2000 years after the fact. No campfire would be hot enough to fuse silica with the other components of glass.

Whatever its origin, glass remains one of the least expensive materials, one of the most recalcitrant to work, among the most ancient in continuous use by man. However, glass has not always been a common and inexpensive commodity. The small vessels made in ancient Egypt were rare and costly, and were used to contain expensive perfumes and unguents. Roman glass cameos were as rare as those made of other precious materials, and as valuable. Even glass tableware and drinking vessels were not available in quantity and only persons of considerable wealth could afford to drink from fragile glass. The availability of glass in almost unlimited quantity and variety is a miracle less than a century old. It tends to blunt our appreciation of the extraordinary rarity and value of early glass.

The methods and ingredients used to make glass and the tools used to form it, have probably changed less throughout the centuries than those used in any other art. Glass is unique among materials available to artists in that it must be worked at a temperature too hot to handle. The earliest glass was fused in molds to make beads or formed around sand cores to make small vessels. The most revolutionary event in glassmaking was the introduction of the blowpipe. Historians do not know when this occurred, but it is generally dated shortly before the birth of Christ. From that time to the present, gravity, temperature, and constant movement of the molten material have played a major part in forming objects of glass. Unlike any other artisan, the glassmaker must keep his work at arms length as he shapes the molten material with blowpipe, wood forms, and metal tools. He may not touch or mold the object with his hands as can the sculptor or potter with clay; nor may he have the



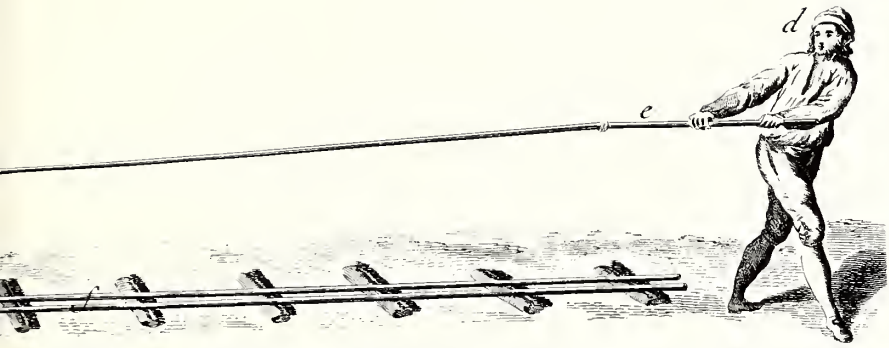
direct contact available to the painter as he brushes pigment on canvas or paper.

The basic fact that glass is a liquid has always affected the forms made from it. Glass art objects have unique properties and are different from any other. The ingredients have changed very little. The earliest glass was a composition of sand, soda and lime (silica, sodium and calcium oxide) fused by heat. These simple inorganic substances have continued in use ever since, although variations have occurred in their proportions. At various times potash and lead have been substituted to vary the quality of the glass, and color has been added by use of copper, manganese, cobalt and other minerals. While style, period and country have altered the shape, decoration, color and use of glass, the fluid nature of the material has remained constant throughout the centuries.

Glass is relatively stable, little subject to natural deterioration. Examples of glass objects have survived in ancient tombs long after many other materials have completely disintegrated. For this reason, available artifacts of glass can tell us much about past civilizations and can provide a more continuous sequence over the centuries than can objects of almost any other material except pottery.

It is appropriate that Toledo's Museum should have one of the most significant collections of glass, for a major factor in the city's economy is the glass industry. Edward Drummond Libbey, who brought his glass company from Cambridge, Massachusetts, to Toledo in 1888, founded this city's predominant industry which continued to prosper and to proliferate in the succeeding decades. Mr. Libbey and a group of his associates founded The Toledo Museum of Art in 1901. As the Museum's principal benefactor he acquired and gave to the Museum the largest part of its important collection of ancient glass. In 1913, a year after the first part of the present Museum building was dedicated, Mr. Libbey began to acquire glass for it. Since that time, the glass collections have steadily grown and today comprise some 5000 items.

To a large degree, Toledo's glass holdings could be described as a collection of collections. While numerous pieces have been acquired individually, a larger portion came from famous private collections of glass. In 1913, 80 pieces of European glass were acquired from the collection of Julius Campe of Hamburg, Germany, and four years later Mr. Libbey bought and presented to the Museum more than 450 items of all periods from the Philadelphia collector, Edwin A. Barber.



The largest single acquisition of glass was the gift of Mr. and Mrs. Libbey in 1923 of the greater part of the collection of Thomas E. H. Curtis of Plainfield, New Jersey. This collection, numbering in the thousands, consisted of ancient and Islamic glass and is probably the largest private collection of its scope ever formed.

In 1950, the Museum acquired nearly 50 pieces consisting mainly of rare German engraved and enamelled glass from the noted collection of Frederic Neuburg of Leitmeritz, Czechoslovakia, providing a balance to the Campe Collection which was predominately Italian. The American collections were enriched in 1959 by the superb group of 55 early pieces from the collection of George McKearin of Hoosick Falls, New York.

The 1960's brought to the Museum the finest known collection of American pressed glass, the gift of its owner Mrs. Harold G. Duckworth of Springfield, Massachusetts. In addition, the Owens-Illinois Glass Company gave a large number of New England Glass Company and Libbey wares which together with a previous gift in 1951 totals some 250 pieces.

This publication marks the reinstallation of the collections in a new gallery, the gift of the Museum's President, Harold Boeschenstein and his wife. Mr. Boeschenstein continues the great tradition begun by Mr. Libbey of leaders in the glass industry who have also been Museum presidents.

The chapters which follow, describe and illustrate in chronological sequence glass through the ages. Previous collections, where known, are noted in the captions with the exception of the extensive Curtis Collection, where objects may be recognized by an accession number beginning with 23. All glass has been acquired from Mr. Libbey's collection or with funds from his bequest, unless another donor is specifically designated in the captions. Rudolf M. Riefstahl and John W. Keefe, of the Museum's curatorial staff, are responsible for the text and captions. We are also indebted to Museum colleagues and scholars, both in this country and abroad, for much valuable advice.

We are grateful to the Museum's Honorary Curator of Glass, Dominick Labino, whose advice has been of inestimable value on many technical questions and problems of installation. He also created the unique glass mural at the gallery's entrance which surely ranks as one of the greatest creative works of art in glass of our century. It is a gift of the artist and his wife. Its colorful warmth welcomes us to the world of glass illustrated in the pages which follow.

Otto Wittmann
Director

ANCIENT GLASS

Pre-Christian Era

14th century B.C.—1st century B.C.

RIBBON GLASS. Mold fused translucent and twisted thread glass. Alexandria or Rome, 1st century B.C.-1st century A.D. (left to right) Bottle. 5¼ inches high. 23.1448. Bowl. Diameter 3 1/16 inches. 68.87. Dish. Diameter 4¾ inches. 23.1490. Bottle. 3¾ inches high. 23.407. Bottle. 4 inches high. 23.1486.

The first piece of glass ever produced has almost certainly decayed and become once more the elements of sand, lime, and soda from which it was made. We can at best only make intelligent guesses as to where, when, and how glass manufacturing originated. Scholarly opinion is still divided as to whether Egypt or Mesopotamia and Syria has the prior claim. The earliest surviving glass vessels, however, are Egyptian and date from the Eighteenth Dynasty, about 1500 B.C. Earlier small, solid beads and inlays can be related to ceramic glazes which have a history in Egypt going back to about 4000 B.C.

Today, we usually think of glass in terms of hand blown tableware or machine blown bottles, but for 1500 years before the birth of Christ vessels were made by methods that involved no blowing at all. It is likely that the first true glass vessels were developed from accidental misfiring of ceramic glazes or from improperly formulated "Egyptian faience," a synthesized ceramic with properties akin to glass. It may seem odd to us—being technologically oriented—that it took so long to develop a true glass industry from such a long tradition of ceramic glazes, but there are two major factors to bear in mind. The first is that all the forming of ceramic products is done while the materials are damp and cold. The idea of forming a similar material at molten heat with an equivalent degree of control would obviously require a fair degree of creative imagination. The other factor is the difference between a kiln and a furnace. To "mature" a ceramic ware, it must be brought up to a certain temperature in a closed kiln. That is to say, a cold formed object is heated to create the finished product. With glass, on the other hand, a process nearly opposite is required. The raw materials must be withdrawn hot from an open furnace to be formed either

with tools or in a mold, and then placed in an oven for controlled cooling. The shift in the function of heat source from ceramics to glass is considerable, while the apparent reversal of the forming-firing sequence could seem a major technological revolution.

Hot-formed glass, however, was not the only method available to the ancient glass worker. Using a solid block or a heavy, roughly-shaped blank formed by casting or pressing, he could slowly and laboriously lathe-grind or wheel-cut a vessel from cold glass. Further, he could hot-form mosaic-like canes and later cut them cold for use in richly colored patterned inlays, or, with reheating, in dishes, bowls, and other shapes. Although the introduction of glass blowing in the late 1st century B.C. widened the range of possibilities in glass enormously, there is nonetheless great richness of decoration and variety of invention apparent in pre-Christian vessels.

To localize the place of manufacture of ancient glass is often difficult. Similarity of color and composition of pieces found at widely separated sites suggest that there was an extensive trade in glass ingots around the eastern half of the Ancient World. Ingots, shipped from a few central locations, could be crushed or powdered for remelting in small local furnaces. The same trade routes also allowed the export of specialized types from one workshop to scattered markets. Heavy demand for glass vessels in a given area could possibly have caused migration of glass workers from one place to another. It appears, then, that glass as an industry functioned in ancient commerce in a manner similar to that of today, but with slower communication lines and a workshop rather than a factory technology. One enormous difference, however, stands out: ancient glass was a commodity of high luxury and, before the development of glass blowing, was owned by only the very wealthy. The presence of glass objects, along with articles of gold and silver in ancient burials, signifies the respect with which this fragile, colorful, difficultly wrought material was regarded.

The earliest glass vessels that can be reliably dated are Egyptian sand-core wares of the Eighteenth Dynasty (1567-1320 B.C.). These were formed by spreading molten glass over a friable, sand-based core. Decoration was provided occasionally by glass inlay, but more often by trailing and combing hot threads of glass of contrasting colors on the body glass. Feet, handles, and spouts were tooled out or added on. These vessels, small in size, are thought to be containers. They are usually brightly colored and opaque or slightly translucent. Simple as the means of production appear to have been, the assurance of execution evident in most sand-core wares indicates a highly developed craft tradition.

In addition to sand-core, Eighteenth Dynasty glassworkers made delicate glass inlays for jewelry. The tomb of Tut-ankh-amon yielded furniture inlaid with mold-pressed glass reliefs, as well as a remarkable headrest ground from two massive pieces of turquoise glass.

We can presume wares in Syria or Mesopotamia analogous to those of Egypt. Little glass from these areas, however, has survived, owing to unfavorable climatic conditions and poorly preserved tombs. If the mold-pressed translucent blue necklace rosettes and other small objects of 13th century B.C. Mycenaen Greece can be taken as evidence, glassmaking in Minoan Crete could also have been extensively practiced before the social and economic upheavals of the 12th to 9th centuries, which, to judge

SAND-CORE ALABASTRON. Whitish trails on blue body. Mesopotamia (?), 8th-7th century B.C. 3⅜ inches high. 61.39.

from the scarcity of examples, must have been disastrous for the ancient glass industry.

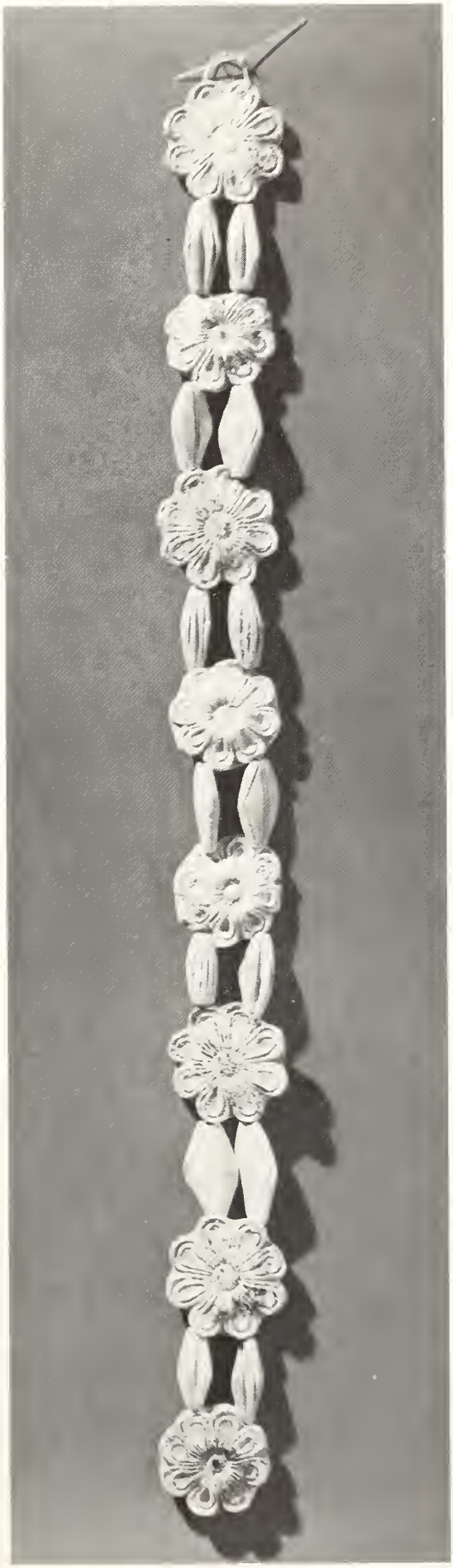
By the 8th century B.C., glass vessels reappear in larger quantity, but, owing to the decline of Egypt as a Mediterranean power, few, if any, objects of subsequent centuries can be positively associated with the Nile Valley until the arrival of the Greeks in the late 4th century B.C. Sand-core wares grow in quantity from the 7th century until the last century before Christ. They are found throughout the eastern Mediterranean. Their wide dispersal is probably due to an increased number of production centers and to the emergence of the Phoenicians as sea traders. Among the characteristic types is a 6th century ware in which straight and zigzag manganese purple stripes are trailed onto an opaque white body color to achieve a simple but striking effect. Others combine multicolored trails combed in a feather pattern on varying body colors (often almost black and rarely the turquoise of the Eighteenth Dynasty) to produce rich contrasts in design. The shapes of the later sand-core wares, as those of the earlier Egyptian, tend to follow shapes found in ceramics, but on a miniature scale, affording one means of assigning rough dates to individual items.

In Syria and Mesopotamia the tradition of massive cutting and grinding survived and was transmitted to the Hellenistic World. There is a series of clear, nearly colorless or blue-green bowls, often hemispherical, dating from the 8th to the 1st century B.C. These were probably cast or mold-pressed and then lathe or wheel-ground to a final contour. Some are fluted and most at least have lathe-cut rings of simple elegance. Judging from recorded finds, these bowls were probably made in the northeast Mediterranean area. Some of them are evident translations of metalwork in their design.

In Egypt under the Ptolemies starting in the late 4th century B.C., a sophisticated court in Alexandria created demands for precious luxuries that led to a revival of the Egyptian glass industry. From the trailing and combing of colored threads on a sand-core vase to creating a bundled cane of multicolored threads is a logical step and one which possibly led to the invention of the fused mosaic technique. Such a bundle of canes could be hot-drawn to a very small cross-section and then sliced cold for inlays of almost microscopically fine detail which could be used in furniture and small objects. Slices could also be laid together in molds and fused together with heat to produce bowls and dishes of great richness. This type of work is called *millefiori* (thousand flowers) and with related techniques persisted until well on in the Christian Era. The demand for colorful variety also encouraged the manufacture of vessels with fused ribbons (some with gold leaf) and lacy twists of yellow or white in a clear matrix as well as imitations of onyx and agate. Many of the *millefiori* wares were lathe-ground and grooved in a manner similar to that employed on the clear bowls. While Alexandria seems to be the most likely center for the production of these decorative glasses, it is possible that Palestine, Syria, and Rome also produced similar types.

The Ptolemaic period in Egypt also saw the revival of mold-pressed figural reliefs of opaque glass. Some of these are difficult to distinguish from similar Eighteenth Dynasty types and indicate that the romance of Egypt captured the Hellenistic court established on the Nile by Alexander the Great.

EGYPTIAN SAND-CORE VESSELS. Polychrome trails on blue body. Egypt, 18th Dynasty, about 1350 B.C. (left to right) Column Flask. 3¾ inches high. 67.2. Vase. 4⅞ inches high. 51.405. Vase. 3 15/16 inches high. 35.55. Column Flask. 4⅜ inches high. 66.14.



NECKLACE. Mold-pressed translucent blue glass rosettes (weathered) with glassy faience links. Mycenaean, 14th-13th century B.C. 11 inches long. 53.139.

SAND-CORE ALABASTRON. Yellow and white trails on translucent brown body. Eastern Mediterranean, 5th-4th century B.C. 7 11/16 inches high. 67.3.

AMULET OF ASTARTE. Mold-pressed translucent blue glass. Eastern Mediterranean, possibly Syria, 15th century B.C. or later. 3 inches high. 23.195.

MOLD-PRESSED INLAYS. (left to right) Opaque red, blue and green glass. Egypt, Ptolemaic or early Roman, 3rd century B.C.-1st century A.D. Baboon. 3 1/8 inches high. 40.170. Crowned head. 1 3/8 inches high. 40.172.

EASTERN MEDITERRANEAN SAND-CORE VESSELS. (left to right) Amphora. Blue and yellow trails on olive-green body. 2nd century B.C. 6⅛ inches high. 23.126. Stamnos. Turquoise, yellow and white trails on translucent dark blue body. Possibly Syria, 4th-3rd century B.C. 3½ inches high. 23.128. Oinochoe. Purple trails on white body. 6th-4th century B.C. 4¼ inches high. 23.159. Alabastron. Turquoise, yellow and white trails on deep blue body. Possibly Rhodes, 6th-4th century B.C. 7 inches high. 23.178.

BOWL. Pale blue-green translucent glass, lathe-ground and wheel-cut. Alexandria or Greece, 2nd century B.C. Diameter 3¾ inches. 23.1071.

BOTTLE. Lathe-cut polychrome gold-band glass. Alexandria or Italy (Cumae), 2nd-1st century B.C. 2¼ inches high. 67.9.

BOWL. Yellow and green lathe-ground millefiori hemisphere, blue and white spiral rim. Alexandria or Italy, 3rd-2nd century B.C. Diameter 5 5/16 inches. 67.10.

Glass of the Christian Era

1st century A.D.—6th century A.D.

Shortly before the birth of Christ, a now nameless—probably Syrian—glassworker realized, perhaps through an accident with the nozzle of a furnace bellows, that glass could be gathered on the end of a metal pipe and formed by inflation. This discovery, combined with the prosperity of the rising Roman Empire, was to make glass available to a far wider public than before, although in ancient times it never became the commonplace material it is today. As luxury ware, however, glass had to compete with vessels of semi-precious stone, gold, and silver. The cold finishing processes of lathe-grinding and wheel-engraving imposed technical difficultities on the glassworker that exceeded those encountered in other materials. Among the earliest blown vessels, those blown in a mold predominate. By blowing in a reusable patterned mold, the glass could be given both form and surface pattern in one operation, an achievement difficult if not impossible in other materials. To judge from surviving examples, Sidon on the Mediterranean coast of Syria was a major center of mold-blown glass output. Some of the Sidonian glassmakers were sufficiently proud of their work to incorporate their names in their patterned molds. The most famous of these was Ennion, whose work is notable for elegance of form and precision of pattern.

Another group of Sidonian mold-blown beakers and bowls is remarkable for the molded inscriptions advising the buyer to remember the maker's name or welcoming the visitor who used the vessel.

Many early mold-blown pieces are very light and thin and show no signs of having been blown on a blowpipe. Recent scholarship indicates that these small vessels often of eggshell thinness were not fashioned on a blowpipe directly, but were blown (with or without a hand mold) from tubing made

previously and heated locally in some sort of torch flame, much in the same manner of working as that of the modern laboratory or carnival glassworker.

There is evidence that by the end of the 1st century A.D. mold-blown wares were being made as far away as southern France. In succeeding centuries mold-blown wares declined in refinement, but spread in popularity. Among the most notable of these later mold-blown types are the rare vessels with Jewish or Christian patterned symbols of the 4th and 5th centuries and the barrel-shaped wine bottles of northern France.

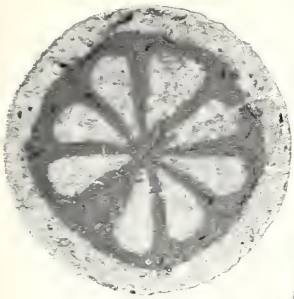
Alexandria seems to have adopted glass-blowing later than other centers, possibly owing to its preeminence as a source of cold-worked polychrome vessels. Some particularly heavy blown pieces with lathe-cut bands or figural wheel-engraving may be products of Alexandrian workshops which found that forming a basic shape or "blank" to be cut later was more easily done by blowing a thick walled vessel than by casting or mold-pressing. It is also to Alexandria that one must probably look for the origins of cameo cutting, although there is good evidence that this technique was also employed in Italy at an early date. Cameo glass is among the rarest types of ancient blown glass, doubtless because of its difficulty of manufacture wherein two layers of contrasting color are blown together, the outer layer being selectively ground away and modelled to create a relief in one color with a contrasting color in the background. The many Wedgwood copies of the famous Portland Vase have made the approximate visual appearance of these wares quite familiar.

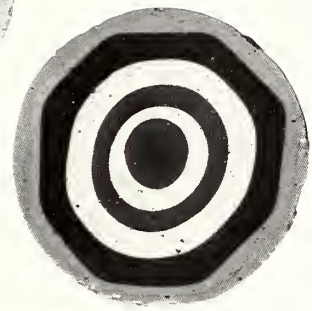
The technique of wheel-engraving probably spread from Alexandria through Italy to the Rhineland, where a series of beakers of 4th century date culminate in the large Worringen Beaker with allegorical scenes.

The idea of hot-tooling applied ornaments to blown glass developed rather slowly, being confined at first to modest frills on handles and beads or pendants in the form of human heads or animals, while developments of the 2nd and 3rd centuries A.D. led to elaborately tooled handles, distortion of blown forms with tongs and pincers, as well as trails "dribbled" abstractly on the surface and often tooled in ridges in a manner called "snake thread." Towards the 4th century the glassworkers became even more daring technically—although perhaps less free in design—by creating tiers of tall loops for handles and geometric lacings that stood away from and sometimes virtually obscured the simple blown forms they adorned.

With the gradual breakdown of the Roman Empire, the broad development of glass was arrested in a manner not unlike that of the "Dark Ages" of the 12th to 9th centuries B.C. Glass was still produced, but generally of less elegance of form and purity of color. Exceptions to this decline are the heavy clear glass cups and bottles cut in hexagonal facets or relief bosses from the Empire of the Sasanians in Iran and Mesopotamia. The changes in political power, in trade, and in social life during the waning centuries of the Antique World were to result in new centers and new styles of glassmaking.

TRAGIC MASK. Opaque white on translucent blue ground cut in cameo technique. Alexandria or Italy (Rome?), 1st century A.D. 3 inches long. Ex-coll: C. C. Coleman, Rome. 23.1571.





FUSED MOSAIC INLAYS. Alexandria or Italy, 1st century B.C.—1st century A.D. Rosette: red on yellow ground. Diameter 1 3/16 inches. 23.300. Bullseye: red, white and two tones of blue. Diameter 1 3/16 inches. 23.253.

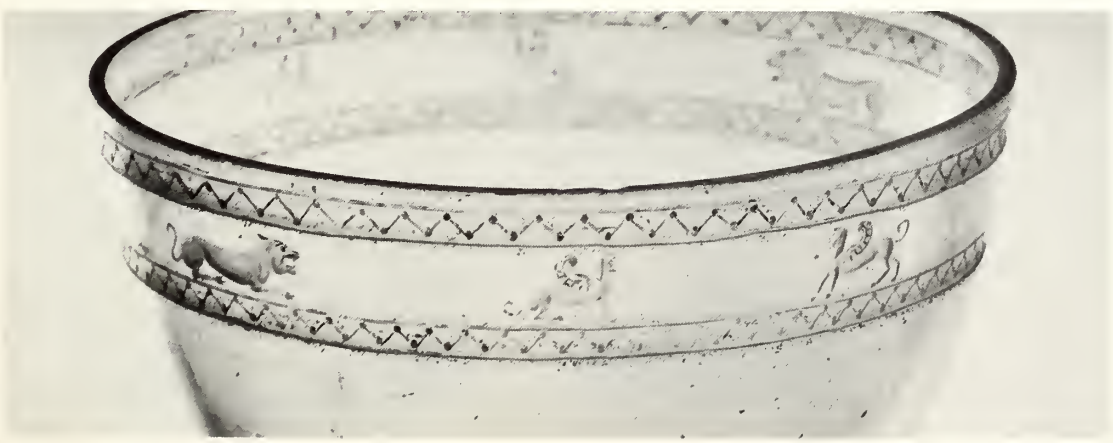
RIBBED BOWL. Lathe-cut amber glass. Alexandria, 1st century A.D. Diameter 7 1/16 inches. 23.674.

CORE-FUSED PENDANTS. Polychrome opaque glass. Eastern Mediterranean, probably Syria or Egypt, 6th century B.C.-2nd century A.D. (left to right) 1 3/16, 1 1/16, 7/8, 5/8 inches. 23.354.

MOLD-BLOWN VESSELS (left to right)
Transparent glass. Syria, 1st century A.D. Pyxis with cover. Amber glass with palmette design. 3¼ inches high. 67.5. Beaker. Green glass inscribed in Greek, "Neikais made me. Let the buyer remember." 3⅜ inches high. 30.5. Bowl. Amber glass inscribed in Greek, "Rejoice that you have come." Diameter 3½ inches. 67.6.

HEAD FLASK. Mold-blown glass weathered silver. Eastern Mediterranean (Syria?), 1st-2nd century A.D. 4½ inches high. 67.8.

BOWL. Transparent glass diamond-point and wheel-engraved. The detail is enlarged about three times. Probably Italy, late 1st century A.D. Diameter 3½ inches. 51.311.



BOTTLE. Transparent weathered green blown glass with snake thread decoration. Syria (Homs), 2nd-3rd century A.D. 3⅜ inches high. 51.374.

KRATER. Transparent green blown glass with engraved bands. Syria, 1st century A.D. 6⅛ inches high. 23.2404.

GOLD GLASS PLAQUE. Gold leaf and red fused between two layers of transparent pale green glass. Latin-Greek inscription may mean: "Victory by conquering." Italy (Rome?), 4th century A.D. Maximum diameter 2½ inches. 67.11.

WINE BOTTLE. Mold-blown transparent blue-green glass with "Frontiniana" imperfectly molded on bottom. Northeastern France, 3rd-4th century A.D. 8¾ inches high. Ex-coll: Evans, England. 48.220.

THE WORRINGEN BEAKER. Transparent pale green, blown lathe-turned and wheel-engraved with mythological scene. Found at Worringen, near Cologne, Germany, 3rd century A.D. 8 inches high. 30.6.

GOLD-GLASS PLAQUE. Gold leaf fused between two layers of transparent pale green glass. Christ with SS. Peter and Paul. Latin inscription reads: "The Lord gives the law." Italy (Rome?), 4th century A.D. Largest dimension 4⅞ inches. 67.12.

BALSAMARIUM (unguent flask). Olive-green transparent blown glass with hot applied threads. Syria, 3rd–4th century A.D. 9¾ inches high. 23.1302.

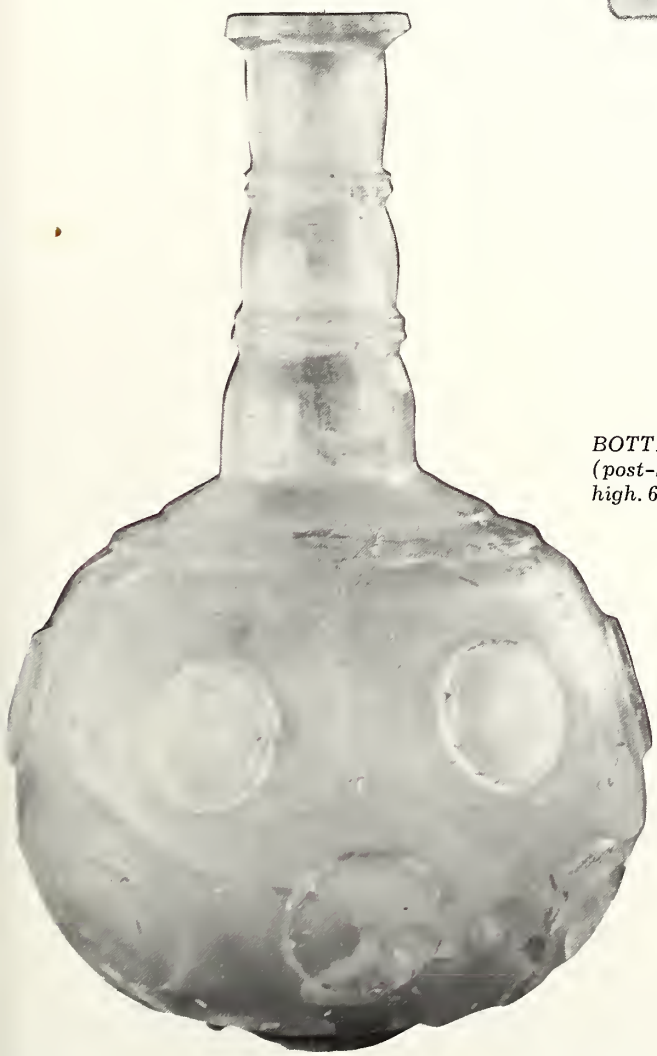
FRAGMENT OF BOWL. Pale green transparent lathe- and wheel-cut glass. Eastern Mediterranean (Alexandria?), 3rd-4th century A.D. Arc of rim 8½ inches. 23.1888.

BLOWN VESSELS. Transparent glass. Syria, 2nd-6th century A.D. (left to right) Jar. Purple streaks and handles. 2⅞ inches high. 23.918. Footed bottle. Dark blue glass. 7 13/16 inches high. 23.644. Footed beaker. Pale green with tooled threads. 5⅜ inches high. 23.1328. Ewer. Pale green with applied threads. 3 5/16 inches high. 08.74. Footed Ewer. Dark blue with coiled foot and tooled handle. 8 7/16 inches high. 23.736.

MOLD-BLOWN VESSELS. (left to right)
Transparent glass. Syria, 4th–5th century A.D.
Ewer. Pale amber body with Christian symbols and olive-green handle. 7¾ inches high. 48.13. Jar. Dark amber glass with Jewish symbols. 3 3/16 inches high. 23.1359.

BEAKER. Pale green, facet-cut. Iran (Sasanian), 4th century A.D. Diameter 3 7/16 inches. 62.26.

GOLD-GLASS PLAQUE. Gold leaf and black on deep amber ground with transparent colorless overlay. Probably Syria (Aleppo?), 9th–12th century A.D. 3 5/8 by 3 7/16 inches. 59.127 (one of five).



BOTTLE. Colorless, transparent, massive cut. Iran (post-Sasanian), 7th–8th century A.D. 5 15/16 inches high. 67.7.

MOSQUE LAMP. Transparent grey glass with enamel decoration. Inscribed in Arabic: "This is one of the objects made for the son of His High Excellency, our honored and well-served Lord Nasir al-Din Muhammad, son of His late High Excellency Arghun, the Dawadar of al-Malik al-Nasir. May Allah the Exalted cover them with His mercy." Syria or Egypt, after 1331. 10¾ inches high. Ex-coll: Eumorfopoulos, London. 40.118.

ISLAMIC GLASS

6th century A.D.—18th century A.D.

After the death of Mohammed in 632 A.D., Islam spread rapidly and by 750 had girdled the Mediterranean from the Pyrenees to Antioch, as well as penetrating as far east as the Indus River. In a sense, Islam had replaced the Roman Empire as the unifying force in Mediterranean and Near Eastern civilization. Because of their rapid expansion into already long civilized areas, the nomadic early Moslems readily assimilated the arts and comforts of the Byzantine and Sasanian peoples they conquered and converted. Early Islamic glass, therefore, is but a continuation of the late Antique tradition. Gradually, however, the Arabic love of nature—as expressed in Mohammed's poetic concepts of creation in the Koran—asserted itself in a wealth of floral ornament and animal forms.

Islamic glass craftsmen exploited their skills in applying pinched or pressed decorative elements to blown shapes and excelled in making vessels that were reinflated after being blown in molds. The wheel-engraved and relief-cut wares of Iran and Egypt, while developed from Sasanian or Alexandrian techniques, acquired a freedom of design which contrasts strongly with the geometric regularity of their prototypes, and tend to resemble Arabic calligraphy. There are also types which, although blown, revive the spirited combed trails of pre-Christian sand-core vessels. A wide range of animal shapes, both solid and blown is derived from Syrian types. Appropriate to the life of a desert people are the so-called "Dromedary Flasks" in the shape of quadrupeds bearing elaborately festooned vases on their backs, characteristic examples of this whimsical class of wares.

Certainly the greatest Islamic contribution to the history of glass lies in the enamelled wares of the 13th and 14th centuries. Mos-

lem glassworkers developed polychrome enamelling and gilding on large bowls, mosque lamps, and bottles to a perfection never before reached. The ability of Islamic glassworkers to decorate their wares was equalled by their ability to blow them. Using an impure greenish or greyish glass, they blew large monumental shapes of a highly sophisticated symmetry, admirably suited to the ornament they were to receive. Mosque lamps with elegantly applied loops for suspension were usually the gifts to particular mosques from important nobles. Most are inscribed in enamel with verses from the Koran or dedicatory statements of the donor. Perfume or rosewater sprinklers, sherbet cups, and large stemmed bowls, elaborately enamelled, attest the luxury of the courts of the Moslem princes for whom they were made. The enamelled or gilded inscriptions and interlaces of Islamic enamelled vessels show a superior sense of design and technical mastery bringing to mind the jewel-like splendor of the title pages and decorative borders of Islamic manuscripts.

The debt of the Italian Renaissance to Islam in science and literature is well known. Less famous is the role Islamic glass played in the great Venetian glass industry of the 15th and 16th centuries. It was Islamic enamelled glass that provided the inspiration for Venetian enamelled wares and Venetian *latticinio* glass may well have been developed from Islamic wares with opaque white trailed decoration. It is even possible that Saracen workmen made glass in Venice. By a curious twist of history, when the Islamic industry declined in the 17th century, it was Venetian craftsmen travelling to Shiraz in Iran, who revived it.

THREE "DROMEDARY FLASKS." Transparent blue-green, olive-green and dark amber glass. Near East (Syria?), 6th-8th century. (left to right) $3\frac{13}{16}$ *inches high. 23.2048. 5 inches high. 23.2044.* $4\frac{1}{16}$ *inches high. 23.2047.*

JAR. Heavy amber glass with tooled trail and mold-pressed prunts with birds. Probably Syria, 7th-10th century. 3½ inches high. 23.2015.

BOTTLE. Mold-blown dark blue glass. Iran (post-Sasanian), 9th-10th century. 9⅝ inches high. 62.27.

BOTTLE. Heavy, colorless facet-cut glass. Iran, 8th-10th century. 5⅝ inches high. 47.6.

BOTTLE. Heavy, colorless facet- and wheel-cut glass. Iran, 9th-10th century. 5⅞ inches high. 47.5.

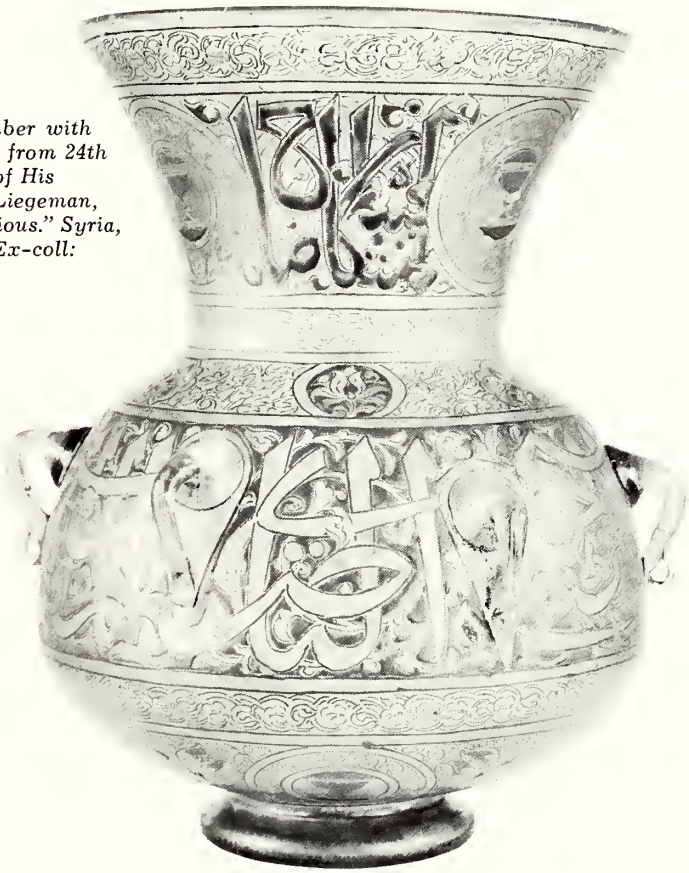
BOTTLE. Mold-blown, transparent amber. Iran (Gurgan?), 11th-12th century. 5½ inches high. Gift of Tel Aviv Museum, Israel. 50.215.

BEAKER. Transparent pale green with tooled blue-green ribs. Syria (?), about 13th century. 5 inches high. 23.2127.

PERFUME SPRINKLER. Transparent pale green with enamels. Syria, 13th century. 7¾ inches high. 66.115.

THE TOLEDO FLAGON. Transparent pale olive-green with enamels and gilding. Inscribed in Arabic: "One of what was made by the order of the Moulowi High Resident to the Emir. May Prosperity attend our Master, the Sultan." Syria (Damascus?), about 1300. 13⅝ inches high. Ex-coll: Monastery of Guadalupe (?); Count of Valencia de Don Juan; Instituto de Valencia de Don Juan. 27.317.

STEMMED BOWL. Pale amber with tooled knop and enamels. Syria, about 1340. 12⅞ inches high. Ex-coll: Zschille, Berlin; Sarre, Berlin. 54.27.



MOSQUE LAMP. Transparent pale amber with enamels and gilding. Inscribed on neck from 24th chapter of Koran; on body: "By order of His Excellency, the Noblest, the High, the Liegeman, the Master, as-Saifi, Sheikhu the Victorious." Syria, early 14th century. 13½ inches high. Ex-coll: Martin, Stockholm. 33.320.

PERFUME SPRINKLER. Mold-blown and tooled transparent blue. Iran (Shiraz), 18th century. 14 5/16 inches high. 53.108.

GOBLET. Dark blue and clear glass with enamels and gilding showing an allegorical procession, probably the Triumph of Fame. Attributed to Angelo Beroviero, Venice, about 1475. 7½ inches high (including restored foot). Ex-coll: Eumorfopoulos, London. 40.119.

EUROPEAN GLASS

Constantine the Great's transfer in the year 330 of the Imperial Roman capital from Rome to Byzantium marked the beginning of the end of Imperial unity which culminated in the sack of Rome by Attila the Hun in 411. Byzantine glass, in the sense of wares stylistically inspired by the canons of Byzantine art, does not seem to have existed. Apparently, Byzantium preferred ceramics or was content to import glass from its eastern provinces.

In the West, the break-up of the Roman Empire had different effects on the glass industry. The decline of commerce led to a provincial type of production, dependent upon local sources of materials. Simple, conical beakers or hemispherical bowls predominate from the 5th to the 8th century. The more notable have trailed threads and a few remarkable examples have rows of fantastic elongated applied blobs or "prunts" recalling Viking art in their exuberance.

Between the 9th and 14th centuries, glass vessels seem to have been very scarce. Owing to impurities — mainly iron — the glass was usually a bluish or greenish transparent gray. Often ribbed or decorated with prunts, the vessels are reminiscent of Syrian products of the 10th to 12th centuries. This type of glass is called *Waldglas* (forest glass) because of the location of glass furnaces near stands of trees where fuel supplies were readily available. Venice, however, with its rich trade with the East had a glass industry of such magnitude that in 1291 all glass factories were ordered moved to the nearby island of Murano (where they remain to this day) to protect the city from fire hazards.

The great Medieval achievement in glass was not in vessels, but in its application to architecture. The stained glass windows of the Gothic cathedral imparted to the grey stone of its piers and vaulting a blaze of jewel-like color which had no parallel.

STAINED GLASS LANCET. Scenes of the Last Judgment. France (Ile de France, Paris?), mid-13th century. 80¼ inches high. Ex-coll: Baron de Lucay; Schniewind. 45.23.

Stained glass panel. Flanders (?), 15th century. 41 by 23 inches. Ex-coll: Lord Stafford, Costessey Hall, Norfolk. 26.6.

The Reniassance

1450—1600

In the 15th century, the revival of classical learning inspired a flowering of art, literature, and science in Italy, while the expulsion of the Moors from Spain made the Western Mediterranean safe for commerce and the growth of industry. Venice, already a flourishing glass center, assumed a preeminence that made her wares famous throughout Europe. Under the influence of Islamic glass, Venetian glassworkers developed enamelled and gilded decoration which was painted on deep blue, clear, and, occasionally, opaque white vessels. Angelo Beroviero, one of a noted glassmaking dynasty, is reputed to have produced in his workshop in the late 15th century a series of brilliantly enamelled pieces with pictorial subjects of allegorical or religious nature.

In northern Europe, change came about more slowly than in Italy. From late Medieval shapes there developed several distinct forms such as the *Humpen,* a tall cylindrical beaker, and the *Roemer,* a goblet with a thick, hollow stem. These shapes were usually decorated with prunts that were sometimes impressed with a "raspberry" pattern. The simple, low prunts on some examples produce intriguing random optical effects, while the pressed ones gather light to create small brilliant accents on the sober *Waldglas* colors. While superficially rustic in character, these vessels reveal a sensitivity to the peculiar properties of the limpidly colored glass from which they were fashioned. Venetian enamelled wares were popular in the North and, in Germany, gave rise to a vogue for broadly, brightly colored *Humpen* of simple form derived from *Waldglas* types, the plane surfaces of which were ideally suited for painting with allegories of the Holy Roman Empire, its Electors, family histories, and trade or guild insignia. These vessels formed a bridge between the north-

ern *Waldglas* tradition and that of southern enamelling.

The real fame of Venetian glass, however, sprang from *cristallo,* a transparent, colorless soda-lime glass of great ductility, reminding one of the purest rock crystal in its clarity. In the early 16th century, *cristallo* was used in substantial, mold-blown or tooled forms of massive elegance, often with discreetly applied dot patterns of enamelling and gilding. Later in the century *cristallo* was blown in lighter shapes and combined with fine threads of opaque white *lattimo* or milk glass to produce a spectacular type called *latticinio*. The *latticinio* type was further refined by trapping minute bubbles in the clear matrix of the white lattice pattern to produce lace glass. Another type called ice glass was produced by chilling the outer surface of a heavy bubble in water and then further inflating it, causing the surface to crack in an irregular pattern. The demand for these wares spread across Europe rapidly and they were imitated widely. The early 16th century copies in France, South Germany and the Low Countries were probably made by local workers untrained in Venetian methods and using their traditionally impure tinted glass formulas. In spite of severe prohibitions (including the death penalty), Venetian glassworkers were induced to leave their native city to set up Venetian style glasshouses in France and the Low Countries. In 1575 England's Queen Elizabeth I granted the Venetian Giacomo Verzelini, a 21-year right to make glass in the Venetian style and to train British glassworkers in its manufacture, thus bringing the beginnings of a modern glass industry to England. Soon the glassworkers of Northern Europe were rivalling the Venetians in elegance of shape and clarity of material.

FOOTED BOWL. Clear with trailed and pinched ribs, dark blue trail on foot, enamels and gilding. Venice, about 1500. Diameter 11¼ inches. 58.17.

TAZZA (footed dish). Clear, mold-blown with enamels and gilding bearing the arms of Louis XII of France and his Queen, Anne of Brittany. Venice, 1499-1514. Diameter 9½ inches. Ex-coll: Spitzer, Paris. 32.1.

PILGRIM FLASK. Clear with enamels and gilding. Venice, 16th century. 13⅝ inches high. Ex-coll: Walker, England. 48.225.

JUG. Lattimo glass with enamels of mythological subjects. Venice, 16th century. 7 15/16 inches high. Ex-coll: von Lanna, Prague; Heugel, Paris. 69.287.

COVERED GOBLET. Clear with lattimo, latticinio, gilding, mold-blown foot and stem, and tooled finial. Venice, 16th century. 12 1/8 inches high. Ex-coll: Campe, Hamburg. 13.439.

LACE GLASS. Venice, late 16th–early 17th century. (left to right) Goblet. 7⅛ inches high. Ex-coll: Campe, Hamburg. 13.414. Plate. Diameter 10⅜ inches. 53.112. Tazza. Diameter 6¼ inches. Ex-coll: Campe, Hamburg. 13.415.

NORTH EUROPEAN GLASS. Free blown. (left to right) Passglas (drinking glass). Clear with tooled trails for measuring shares. Germany, 16th century. 13⅜ inches high. Ex-coll: Campe, Hamburg. 13.482. Stangenglas (beaker). Green glass with applied trails, foot, and prunts. Germany or Holland, about 1520 (enamelled arms and diamond point inscription added in 1620). 9¼ inches high. 53.122.

COVERED VASE. Pale brown, partly mold-blown with enamels and gilding. Venetian style, probably France, first half of 16th century. 11¼ inches high. Ex-coll: Campe, Hamburg. 13.441.

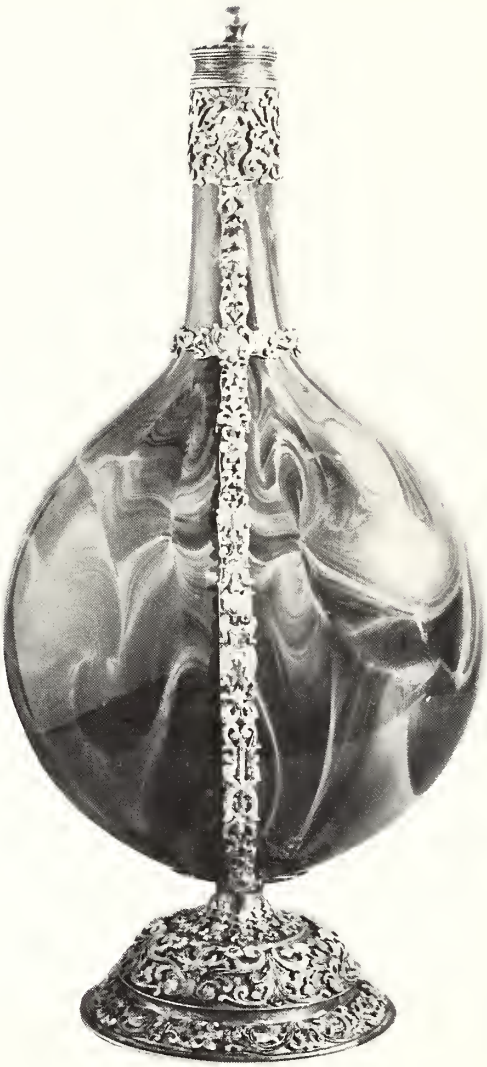
BEAKER. Grey crackle glass (ice glass), with applied pressed masks, pearling, and gilding. Venetian style, Flanders, about 1600. 8⅜ inches high. Ex-coll: Campe, Hamburg. 13.423.

GOBLET. Pale brown with enamels and gilding. Latin inscription on rim reads: "Lord, open thou our lips and our mouths shall show forth Thy praise." French inscription with heart rebus between heads of man and woman reads: "Given to you by a good heart." Probably made on the occasion of a marriage. France, about 1560. 6⅞ inches high. Ex-coll: Walker, England. 48.222.

GOBLET. Pale green witth lattimo, lace glass, enamels, and gilding. The subject is the sacrifice of Isaac. Reverse bears monogram HLX in blue shield. Bohemia, about 1600. 7⅞ inches high. Ex-coll: Neuburg, Leitmeritz. 50.12.

COVERED VASE. Pale brown with unfired lacquer and gold (cold enamel) coat of arms. Venetian style, Germany (Nuremberg), 1600-1620. 13½ inches high. Ex-coll: Campe, Hamburg. 13.450.

JUG. Dark blue with enamels and gilding. Unmarked parcel-gilt silver cover. Bohemia, about 1600. 7⅜ inches high overall. 53.119.



MOUNTED PILGRIM FLASK. Agate glass. Venice, about 1600. Enamelled, silver gilt mounts. France, early 17th century. 12½ inches high. 47.56.

VASE MOUNTED AS EWER. Latticinio. Venice, about 1600. Jewelled, enamelled, and silver gilt mounts by Heinrich Straub, Nuremberg (active 1608-1635). 11 11/16 inches high. Ex-coll: Goldschmidt-Rothschild, Frankfurt. 60.36.

STAINED GLASS ROUNDEL. Monochrome enamel with touches of yellow. The Prodigal Son gambling with courtesans. Holland, about 1520. Designed by Peter Cornelisz. (about 1490-after 1532). Diameter 10⅝ inches. Ex-coll: von Pannwitz, Hartekamp. Gift of Rosenberg and Stiebel, Inc. 57.49.

CRISTALLO GLASS. Venice or Venetian style, early 17th century. (left to right) Goblet. 4¼ inches high. 13.429. Goblet. 7¼ inches high. 13.427. Tazza. 4½ inches high. 13.433. Goblet. 7⅝ inches high. 53.109. Goblet. 7 inches high. 13.426. Sweetmeat dish. 6¼ inches high. 13.432. Goblet. 5⅞ inches high. 13.428. Ex-coll: Campe, Hamburg (except for 53.109).

The Baroque Era

1600—1730

The early 17th century saw the gradual evolution of the style called Baroque. In its development, the stable forms of the Renaissance, inspired by classical antiquity, tended to lose their structural function and became elements in an expressive artistic vocabulary of dramatic power. Contrasts of light and dark, tall and squat, simple and elaborate, became the grammar of the style. Exaggeration for effect supplanted the simpler declaration of the Renaissance.

As the century progressed, the Baroque spirit was felt by glass designers all over Europe. In South Germany, some *Humpen* became taller and more slender in proportion, sometimes flared, and were often fitted with lids surmounted by elaborate baluster-shaped finials, while in the Low Countries the *Roemer* became preeminent as a presentation piece suitable for engraving with elegant curvilinear calligraphy or figural subjects. From the 17th century *Roemers* with tall narrow stems and globular bowls predominate, although the earlier heavier flaring forms also continued.

The glassworkers of the Low Countries were especially intrigued by Venetian *cristallo* and produced elegant, almost weightless flute glasses and goblets of mannered profile virtually indistinguishable from Venetian prototypes. Ice glass beakers of high quality with molded prunts were also made in Flanders. Although France and Spain continued to produce Venetian style glass until the 18th century, it found greatest favor in the North.

By the early 17th century, the Venetian "monopoly" on its wares had so diminished that in 1612 in Florence, Antonio Neri published his famous work, *L'Arte Vetrario*. Before the century closed, enlarged editions of

BAROQUE DRINKING GLASSES (left to right) Flügelglas ("wing" goblet). Clear glass with red, white, and blue tooled twist stem. Diamond-point engraved with hunting scene. Holland, late 17th century. 11 5/16 inches high. Ex-coll: le Roy; Franchomme, Brussels. 66.117. Roemer. Blue-green glass with spiny prunts, the bowl engraved with grapevine. Holland, 17th century. 4¾ inches high. 53.30. Flute Glass. Clear glass diamond-point engraved with lion, motto in Dutch of the United Provinces: "Strength in Unity," and orange tree stump putting forth new shoot (probably emblematic of birth of Prince William III of Orange in 1650). Holland, about 1665. 17⅜ inches high. 58.22. Roemer. Green glass with raspberry prunts, wheel-engraved Latin inscription reads "Always the same." Signed and dated 1676 by Willem van Heemskerk of Leyden. Holland or Germany, about 1676. 7¾ inches high. 53.89. Roemer. Green glass with raspberry prunts, wheel-engraved with dwarf musicians after etchings by Jacques Callot, grapevines, and fantastic fish. Signed and dated 1661 by the Dutch engraver Carel Du Quesne. Germany, about 1660. 11½ inches high. 53.28.

this work had been published in England, Holland, and Germany. French and Spanish editions did not appear until after 1750. These publications doubtless reflected the great demand for technological works. It is no accident that they were first published in countries which dominated the European glass industry.

Towards the middle of the 17th century, German enamel painters developed a translucent technique of painting on glass vessels derived from domestic stained glass window roundels. The earliest of the *Hausmaler* (home painter) or free-lance artists who painted glass and ceramics in a personal, rather than folk style, was a South German, Johann Schaper. His delicate figures, coats of arms, and panoramic landscapes were painted chiefly in black, highlighted by subtle tints of color. Abraham Helmhack, working in a broader style, chiefly painted in black, intricately mingling figures, foliage, and scrollwork.

The late 17th and early 18th centuries comprised the great Baroque age. The Peace of Westphalia, concluded in 1648, encouraged a sense of security, and during the subsequent 100 years European science, scholarship, art and industry made some of their greatest strides. In glass, security and confidence took shape in heavier, more monumentally sculptural forms, with a use of baluster stems which varied in basic profile from one center to another. These massive forms were often decorated with engravings of exquisite detail. The demand for such vessels necessitated basic changes in glass technology and the scientific spirit of the age met the challenge.

Towards the end of the 17th century two developments, one probably in Bohemia, the other in England, presented innovations which enabled the new taste to terminate effectively the dominance of *Waldglas* and Venetian style wares. The formulation of a good potash glass in Bohemia and stable lead glass in England gave European glass decorators an engraving medium they had previously lacked. German glassmakers, using local materials, developed a glass without soda, using instead, potash mixed with a high proportion of lime. This glass was equal in clarity to *cristallo*. This heavy, hard glass was first worked in baroque forms and decorated with trailed and pinched decoration, but glass cutters soon realized that it was admirably suited to wheel-engraving, an ancient technique which had been applied to rock crystal in Italy and Germany since the 16th century.

Prior to the introduction of potash glass, the most distinguished early engraving had been done on thin Venetian type glass at Nuremberg by members of the Schwanhardt family; G. F. Killinger was an outstanding later member of this school. Shortly after its appearance in Bohemia, potash glass was made at Potsdam and engraved in Berlin in a studio established in 1687 under the patronage of the Elector of Brandenburg. Gottfried Spiller and his pupil, Heinrich Jäger, are among the chief artists associated with this center, which was active through the 18th century. Many of these noted engravers are represented by work in the Museum's collections.

The great center of German engraving was in Bohemia and Silesia on either side of Riesengebirge, near good supplies of glass and water power. At first Bohemia excelled in the art of engraving, but as the 18th century advanced Silesia assumed the lead. The names of few Silesian engravers are known. An exception is C. G. Schneider, who worked at the resort of Warmbrunn.

A remarkable and famous Bohemian technique, recalling an ancient Alexandrian practice, involving grinding two tumblers

so that they fit precisely one inside the other, sandwiching between them designs engraved on gold or silver leaf. Such *zwischengold* and *zwischensilber* glasses are usually cut in broad vertical facets on the outside and date to about 1730. Because of the complexity of execution, many of them are commemorative pieces.

Another German innovation was the formulation of a relatively inexpensive copper-ruby glass. Andreas Cassius of Hamburg and Johan Kunckel, a Bohemian chemist working at Potsdam for the Elector of Brandenburg, were primarily responsible. It is interesting to note that many technological improvements in glass which occurred close to the end of the 17th century were achieved under the patronage of and in glasshouses owned by the German nobility. A parallel can be found in the development of German porcelain at Meissen a generation later, indicating the interest of the baroque nobility in science and industry.

An offshoot of the German glass industry was that of Russia, which was dominated by wares made solely for court use in Bohemian style from the time of Peter the Great to that of Catherine the Great, both of whom had close ties with Germany.

The second major development of the end of the 17th century was the perfection of a good lead glass in England. Prior to 1675, England had been dependent on Venetian style glass made by followers of Verzelini such as Sir Robert Mansell, who was really an industrialist rather than a craftsman or technologist. British tables were usually decorated with glass made to British patterns in Venice.

In 1673, George Ravenscroft, a businessman with extensive contacts in Venice and a lively concern for chemistry, began experimenting with native raw materials to free the English market from foreign domination in ingredients and production. The Glass Sellers' Company of London was also working along the same lines and, in the following year, recognizing the progress Ravenscroft was making, reached a cooperative agreement with him, wherein Ravenscroft conducted research while the company provided facilities, workmen, and financial backing.

Early in his research Ravenscroft had difficulty in fusing the native crushed flint he was using as a silica source. He solved this problem by adding more potash, only to encounter the same difficulty as did the chemists first working with potash glass in Germany. The glass would not remain clear after blowing, but soon after annealing (controlled cooling to reduce stresses) developed a fine, lacy network of cracks called "crizzling." Crizzling is not simply a visual disfigurement, but is a sign of instability inherent in the formula which produces a glass that decomposes. In 1675 Ravenscroft formulated a workable lead glass. Through a substitution of sufficient lead oxide for part of the potash he produced a glass that was not only stable, but was soft enough to cut readily without chipping, and of a refractive brilliance never before achieved. In 1677, the Glass Sellers' Company adopted a raven's head seal to identify wares produced to its designs with Ravenscroft's formula. So successful was the introduction of lead glass that it became a standard of desirable glass quality and the term "crystal" came to mean lead glass rather than Venetian *cristallo*.

Although early English lead glass reflects Venetian prototypes in the continued use of trailed and pinched decoration, the material suggested heavier forms more appropriate to it. Use of the new type of glass soon spread and the late Baroque period owed much to the contribution of the English

spirit of invention. That the qualities of the new English glass were recognized abroad at an early date is shown by the fact that the noted German engraver, Gottfried Spiller, decorated vessels of English manufacture.

While Germany and England were making great strides, Holland with its new commercial and colonial prosperity not only produced painters such as Rembrandt and Vermeer, but also demanded glass in the new heavy manner, liberally engraved. The *Waldglas* and Venetian style wares had faded into obscurity by the end of the 17th century. Since the 16th century, the Dutch had had a strong tradition of engraving glass with a diamond point. Many of the Dutch diamond engravers signed their work; one of the most famous was Willem van Heemskerk of Leiden who excelled in elegant calligraphic designs on *Roemers*. The Dutch, who unfortunately failed to produce a good potash or lead glass, imported many vessels from Germany (sometimes engraved for the Dutch market) and later from England. In the early 18th century, however, Dutch engravers began to employ wheel-engraving which yields more dramatic effects in the play of light than diamond-point work. They soon surpassed the high standards of German engravers and achieved effects of remarkable virtuosity in the control of small, whirring abrasive wheels on inconveniently curved surfaces. A native Dutch technique invented by Frans Greenwood of Rotterdam involved the use of the traditional diamond point. Called stipple engraving, it required meticulously tapping the surface of the glass with the point to produce painstakingly thousands of tiny chips in the desired design on the surface which appear as highlights against the darker areas of untouched glass.

France, for all the fame of its ceramics in the Baroque Era, never achieved the same distinction in glass, although Bernard Perrot of Orléans experimented with colored and opaque glasses and seems to have been an innovator in casting and molding. Spain, too, lagged behind the rest of Europe, continuing to produce wares of a debased Venetian type. By their adaption of Venetian forms to local shapes, however, and robust exuberance of tooled decoration, they are redeemed from dullness and possess a quality of rustic humor.

By the middle of the 18th century European glass had achieved an international style which, with regional variations, was dependent upon technologies and skill developed by the Germans and the English. The supremacy of Venice, unquestioned in the Renaissance, was over.

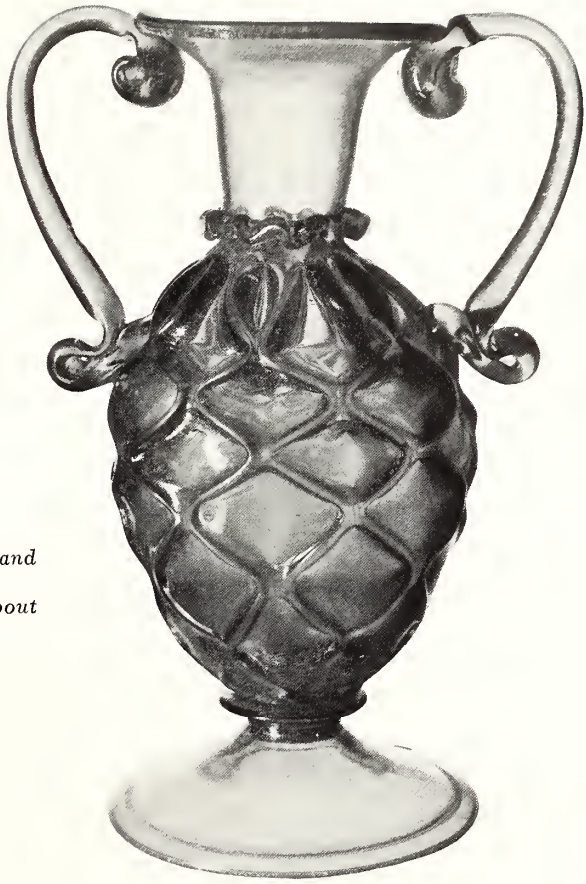
FLUTE GLASS. Clear, diamond-point engraved with portrait and inscription reading: "God Bless King Charlis (sic) *the second." Holland (for the English market), after 1680. 15⅞ inches high. Ex-coll: van der Poll, Noordwijkerhout. 66.116.*

HUMPEN. Green with enamels and gilding. Allegory of the Peace of Westphalia with the Holy Roman Emperor, King of France, and Queen of Sweden. Inscribed with laudatory poem. Germany (Franconia, probably Kreussen), 1651. 10½ inches high. Ex-coll: Ducal Castle, Dessau; Neuburg, Leitmeritz. 50.29.

COVERED BEAKER ON BUN FEET. Clear with black enamel (schwarzlot). View of a city (Nuremberg?) and hunting scene on cover. Germany (Nuremberg), about 1665. 7¼ inches high. Ex-coll: Neuburg, Leitmeritz. 50.36.

BEAKER ON BUN FEET. Clear with transparent enamels of figures and ruins in a landscape, signed by Johann Schaper of Nuremberg (1621-1670). Germany (Nuremberg), about 1665. 3⅝ inches high. Ex-coll: von Forstner, Halle; Rosenberg; Neuburg, Leitmeritz. 50.35.

GOBLET. Clear, wheel-engraved in style of Georg Schwanhart, the Younger (died 1676) with ruins and figures in a landscape. Germany (Nuremberg), about 1675. 10¾ inches high. Ex-coll: Campe, Hamburg. 13.489.



THE SAVOY VASE. Crizzled blue with trailed and pinched decoration. Attributed to George Ravenscroft's glasshouse. England (London), about 1675. 8 5/16 inches high. Ex-coll: Henry Brown, England. 47.6.

POSSET POT. (Posset was a mixture of wine or ale with milk.) Clear with molded ribs. Made at the glasshouse of George Ravenscroft (1618-1681). Raven's head seal on spout. England (London), about 1677. 3 3/8 inches high. Ex-coll: Horridge, Cardington, Shropshire. 60.3.

BOWL. Clear with trailed and pinched decoration. England (London), about 1680. Diameter 13 inches. 50.276.

STOPPERED EWER. Clear with trailed and pinched decoration. Attributed to George Ravenscroft's glasshouse. England (London), about 1680. 11⅜ inches high. 48.223.

GOBLET. Clear with gadrooned bowl and raspberry prunts on closed stem. Possibly from the glasshouse of Hawley Bishopp, Ravenscroft's successor. England (London), probably 1682-1690. 12 inches high. 54.15.

CANTIR (water vessel). Pale green mold-blown with trails and tooled bird finial. Spain (Catalonia), 18th century. 10¾ inches high. Ex-coll: Daime, Paris. 25.118.

EWER. Clear mold-blown with trails and tooled flower finial. France (Orléans region), early 18th century. 9½ inches high. Ex-coll: Daime, Paris. 25.114.

JUG. Ruby glass with wheel-engraving and silver-gilt mounts bearing Augsburg mark. South Germany, late 17th century. 9 inches high. Ex-coll: Campe, Hamburg. 13.444.

COVERED HUMPEN. Clear with black enamel (schwarzlot) *by Abraham Helmhack (1654-1724). One of the two coats-of-arms is Schiller of Nuremberg; an Old Testament scene on the other side, and vignettes on the cover illustrating the German couplet: "Let constant hope not sink." Germany (Nuremberg), dated 1681. 10 inches high. Ex-coll: Campe, Hamburg. 13.454.*

BEAKER. Clear with wheel-engraving of allegories of the Five Senses after engravings by Martin de Vos. Bohemia, late 17th century. 5⅜ inches high. Ex-coll: Koula, Prague; Neuburg, Leitmeritz. 50.26.

BEAKER. Clear with wheel-engraving attributed to Heinrich Jäger (active 1690-1720). Germany (Potsdam?), about 1710. 6¼ inches high. Ex-coll: Ducal Castle, Dessau; Neuburg, Leitmeritz. 50.42.

ENGLISH ENGRAVED GOBLETS. (left to right) Clear lead glass with mold-blown stem, arms and inscription of Chatfield family, 1718. 7⅞ inches high. Ex-coll: Francis, Drumgay, Guildford; Hughes, London. 63.13. Clear lead glass with mold-blown stem. "Kissing Spot" (the horse of Westphalia), forget-me-nots, and star with Latin inscription reading: "Liberty unbridled," a symbol of pro-Protestant sentiment in England, about 1725. 7⅝ inches high. Ex-coll: Mason; Clements; Hughes, London. 63.14.

CANDLESTICKS. Clear lead glass. England, about 1730. 8¾ inches high. Ex-coll: Berney; Hughes, London. 63.9-10.

POKAL (covered goblet). Clear lead glass. England, early 18th century. Wheel-engraved with putti in a Bacchic procession by Gottfried Spiller (1683-1721), Germany (Berlin), about 1710. 14¼ inches high. 53.107.

POKAL. Clear, engraved in high and low relief with putti playing instruments. Germany (Potsdam), about 1720.17⅛ inches high. Ex-coll: Ducal Castle, Dessau; Neuburg, Leitmeritz. 50.43.

EWER AND BASIN. Facet-cut and painted with hawking and hunting scenes in black enamel (schwarzlot). *Probably by Ignaz Preissler (1676-about 1739). Germany (Silesia), about 1730. Ewer. 7⅛ inches high. Basin. 8½ by 11⅛ inches. Ex-coll: Schwartz, Stuttgart; Neuburg, Leitmeritz. 50.45-46.*

BEAKER. Clear glass (with ruby glass insert in bottom), facet-cut and decorated in zwischengold *technique with Hebrew inscription reading: "of Moses (Moishe) physician of the holy congregation Halberstadt." Probably made for a confraternity established for the care of the sick. Bohemia, about 1730. 3⅝ inches high. Ex-coll: Neuburg, Leitmeritz. 50.20.*

SWEETMEAT DISH. Facet-cut and wheel-engraved. Germany (Silesia), about 1730. 4½ inches high. Ex-coll: Seligmann, Cologne: Neuburg, Leitmeritz. 50.52.

Rococo to Victorian

1730—1850

Towards the middle of the 18th century European taste began to tire of the *fortissimo* of the Baroque style and its massive symmetries. Gradually, a lightness and airiness pervaded the style and exotic elements in the Chinese manner crept in, introducing the assymetrical, feathery forms which we call Rococo. Blown glass, being dependent upon rotary motion imparted to the blowpipe, is of necessity symmetrical in shape and was not ideally suited to the unbalanced forms of the Rococo. The glassblower could at best only simplify and lighten his shapes, leaving the definitive expression of the new style to the engraver, cutter and enameller.

The change in taste from monumental Baroque to gossamer Rococo, did not occur overnight throughout Europe. France, the adoptive parent of the Italian-born Rococo style, spread it to Germany and England. Although French glass did not come into its own until the emergence of Baccarat, Clichy and St-Louis wares in the 19th century, the impact of French style on German and English glass should not be overlooked.

In England by the middle of the 18th century, colored and opaque vessels began to appear with much of the interest centered at Bristol. This great English port was the point of import for cobalt oxide shipped from Saxony. Used in glass, it resulted in the deep, transparent shade of glass called "Bristol Blue." While some shapes retained Baroque strength of contour, there was an attempt to break up the solidity of form by broad vertical facet cutting, imparting a series of reflective surfaces to the vessels. The stems of English goblets and wine glasses gradually lost their baluster form and became cylindrical to permit the display of delicate spiral twists of air or opaque white and colored threads. The bowls, too, change from conical shapes to diminutive buckets to complement the straight stems

and provide a better surface for decoration. The rise of a prosperous middle class in England made possible a wider possession of good glass than ever before. The number of inscribed glasses increased markedly and many were engraved with political mottoes, commemorative sentiments, emblems of trade societies and heraldic devices. Much of the engraving was done in England, but the best work continued to be done in Holland. English wares engraved in Holland often returned for sale in their native country. In the 1760's, two brothers, William and Ralph Beilby, working in the glass center of Newcastle-on-Tyne, excelled in the enamelling of arms and romantic landscapes within free Rococo borders reminiscent of the fantasies of Paul de Lamerie, the famous English Huguenot silversmith.

In Germany, covered cups and goblets became more slender as the 18th century progressed and were sometimes given reverse curves in the bowl where it meets the stem. The decoration of Silesian engravers lightened and sometimes rivalled once more the work of Dutch craftsmen. Towards the end of the century an Austrian, J. J. Mildner, elaborated the already complex *zwischengold* technique by including colored lacquers in superb portrait glasses of plain tumbler shape with simple neo-classical engraving.

Meanwhile, the English also turned from the Rococo style to the simpler contours of neo-classicism, but the refractive richness of their glass seemed to demand some further expression with the result that elaborate facet-cutting became common on English wares. The trend was abetted by economic factors when in 1777 a tax was placed on opaque twist stems. This tax was one of a series of levies on the English glass industry in the late 18th century. These taxes, like the Stamp Act which stimulated the American Revolution, were intended to finance Britain's military establishment, but succeeded mainly in imposing a hardship on the industry. Because of loopholes in the laws, glass produced in Ireland enjoyed a favorable tax position, and many English companies transferred their operations to Ireland. As a result, most English and Irish facet-cut wares are indistinguishable although both are called Waterford glass because of their presumed association with the Irish glass center of that name.

Waterford glass was very popular in France, being widely imitated, especially at Lyons, and helped to lend impetus to the emergence of the French Industry in the 19th century.

The optical properties of facet-cutting were also popular in Germany in the early 19th century. The Germans, however, were not content with the clarity of lead glass and often cut facets through translucent stained tints or opaque overlays. The Baroque predilection for engraving never died out in Germany. Many German facet-cut wares are also engraved. The combination of facet-cutting, engraving and color on solid bulbous shapes derived from classical forms resulted in the *Biedermeier* style in glass. *Biedermeier* wares were to provide the inspiration for American cut and engraved glass of the 19th century.

POKAL. Facet-cut and wheel-engraved with crowned trophies of arms and sailing ship with Dutch inscription reading: "The nation's welfare." Germany (Saxony), for the Dutch market, about 1750. 19½ inches high. 53.86.

GLASS BOX. Clear glass, silvered and gilded, wheel-engraved on dark green background. Interior is gold-mirrored glass with engraving; copper gilt mounts. Germany (Silesia), about 1760. 3¼ inches long. Gift of Rosenberg and Stiebel, Inc. 55.212.

GOBLET. Wheel-engraved in low and high relief, cut and stippled. Crowned monogram PHS engraved on foot. Workshop of Christian Gottfried Schneider (1710-1773). Germany (Warmbrunn, Silesia), about 1755. 6⅝ inches high. 15.144.

GOBLET. Wheel-engraved with double-headed eagle of Russia and monogram of Catherine the Great (1732-1796). Russia (probably St. Petersburg), about 1780. 7⅜ inches high. Gift of Mrs. Homer P. Hargrave. 60.24.

PAIR OF COVERED CUPS. "Bristol Blue" glass, facet-cut with silver-gilt mounts by Thomas Heming (London, active 1745-1781/2). England (Bristol or London), 1752/3. 12 3/16 inches high. Ex-coll: Mulliner; Price, England. 68.73.

GOBLET. Clear with opaque white twist stem, enamelled with landscape by William Beilby (1740-1819) and Ralph Beilby (1743-1810). England (Newcastle-on-Tyne), 1765-70. 7 inches high. Ex-coll: Clements; Hughes, London. 63.15.

GOBLET. Clear glass with air twist stem, wheel-engraved with the arms and motto "By faith I obtain" of the Worshipful Company of Turners (lathe workers) of London, England, 1750-1760. 9¼ inches high. 50.279.

"PRIVATEER" GLASSES. Clear with opaque white twist stems and wheel-engraving. England (Bristol), about 1760. Left: Inscribed "Success to the Hercules Privateer." 6⅛ inches high. Ex-coll: Griffin, Gloucester. 67.139. Right: Inscribed "Success to the Lyon Privateer." 6 1/16 inches high. Ex-coll: Griffin, Gloucester. 67.138.

DECANTER. Clear glass, enamelled with the arms of George III and the Prince of Wales. By William Beilby (1740-1819) and Ralph Beilby (1743-1810). England (Newcastle-on-Tyne), about 1762. 9¼ inches high. Ex-coll: Clements; Hughes, London. 63.16.

VASE. Opaque white glass ("enamel glass"). England (Bristol), 1760–1770. 10 1/16 inches high. 64.35.

CANDLESTICKS. Clear with facet-cutting. England, about 1770. 14 inches high. Ex-coll: Clements; Hughes, London. 63.11–12.

CHANDELIER. Clear glass facet-cut and partly mirrored. England, 1775–1780. 75 inches high. 56.68.

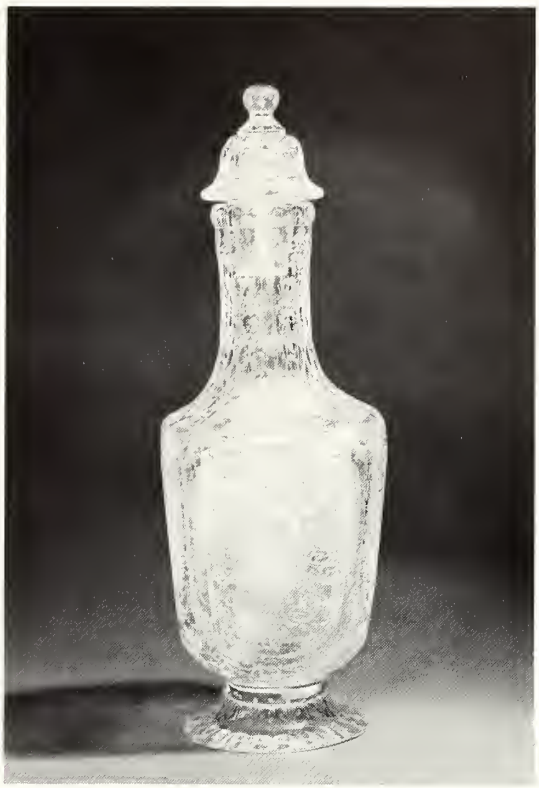
BEAKER. Clear glass, facet cut with zwischengold *and color inlays. Female portrait with dedicatory inscription and diamond engraved coat-of-arms. By J. J. Mildner (1763-1808). Austria, dated 1792. 4¾ inches high. Ex-coll: Neuburg, Leitmeritz. 50.47.*

GOBLET. Facet-cut and diamond-point stippled by David Wolff (1732-1790) with an allegory of the Batavian Republic. Holland (The Hague) on English glass, about 1785. 5¾ inches high. Ex-coll: Neuburg, Leitmeritz. 50.34.

FOOTED BOWL. Clear glass, acid-etched (?), wheel-engraved and facet-cut. Bohemia, about 1830. 6 inches high. 62.11.

GOBLET. Clear glass with ruby flashing, engraved with scenic vignettes and commemorative inscription. 5 11/16 inches high. Bohemia, dated 1849. Gift of Dr. Frank W. Gunsaulus. 13.527.

DECANTER AND BEAKER. Facet-cut and wheel-engraved with transparent enamels. Bohemia, about 1840. 11⅜ and 3¼ inches high. 13.476-77.



DECANTER. Wheel-engraved. J. & L. Lobmeyr Glassworks. Austria (Vienna), about 1885. 10½ inches high. Ex-coll: Brady, New York; Farrell, Loudonville, N.Y. Gift of William F. Donovan. 50.286.

COVERED URN. Cobalt blue with opaque white trails and finial. Gjøvik Glassworks. Norway (Lake Mjøsa), 1810–30. 13¼ inches high. Ex-coll: Temple, Philadelphia. 23.3122.

AMERICAN GLASS

In recent years, increased interest in glass produced by this country has been responsible for a number of publications on the subject. This research has led to the establishment of a generally accepted system of dates for the manufacture of American glass. These dates are intended only to serve as guidelines, for the styles always overlapped.

The Early American Period

1739—1830

The glass industry in America began around 1608 in the Jamestown colony of Virginia. The English founders of the colony had hoped that the abundant supply of sand near virgin forests would foster establishment of a profitable glass industry. The preservation of English forests had become a necessity, and the firing of glass furnaces with wood created a severe drain on the dwindling timber supply of England. Jamestown appeared to be an ideal solution to the problem, and the London Company hoped that an increasing supply of glass goods would be shipped back to England. The difficulties of frontier life, however, caused attention to be turned to agriculture, and the Jamestown glassworks never produced anything more than beads, bottles, and crude drinking vessels. The design of these was indubitably English and began the tradition of borrowing styles and techniques which has persisted in American glass until the present day.

In spite of this inauspicious beginning, hope for successful glass manufacture in this country persisted, and attempts at glassmaking were made at Salem, Massachusetts; New Amsterdam, New York; and Philadelphia. None of these ventures met with great success, and little glass was produced between the early 17th century and the

AMERICAN GLASS, 1820-1910 (left to right) Pitcher. Blown, blue and white looped decoration, clear applied handle and foot. New Jersey, about 1820. 10 inches high. 55.216. Decanter. Blown and cut, "Senora" pattern. The Libbey Glass Company, Toledo, Ohio, about 1896-1906. 14⅞ inches high. Gift of Owens-Illinois, Inc. 51.226. Bowl. Blown 3-mold, G-II-18 pattern. Attributed to the Boston and Sandwich Glass Company, Sandwich, Mass., about 1825-1835. Diameter 9⅝ inches. 59.61. Covered Casket and Tray. Pressed, blue, "Gothic" pattern. Attributed to the Boston and Sandwich Glass Company, 1830-1850. 7¼ inches high. Gift of Mrs. Harold G. Duckworth. 68.34. Pitcher. Pressed, "Diamond Point" pattern, applied and tooled handle. Attributed to The New England Glass Company, East Cambridge, Mass., about 1850. 9 inches high. Gift of Owens-Illinois, Inc. 51.184.

establishment of Caspar Wistar's southern New Jersey glass factory in 1739. In spite of a flooding of the American market with English glass, the Wistar factory survived. The tradition begun by his workmen and those of a factory opened in 1781 at nearby Glassboro is today known as South Jersey.

South Jersey glass was generally free-blown and subsequently tooled into pitchers, bowls, and bottles of beautiful simple lines. A large portion of this glass displayed superimposed decoration of crimped and pinched bands of glass, trailing, or quilling. The colors were generally those occurring naturally in the metal—green, aquamarine, amber—although swirled and looped effects were possible by the introduction of additional opaque colors of red and white. Although the shapes to which these decorations were applied were derived from the Anglo-Irish tradition, the most original and inventive technique employed by South Jersey craftsmen was the "lily-pad" motif. This device which resembled the water lily stem and pad was an American contribution to glassmaking and had no known European antecedents. In the early 19th century, many of the South Jersey stylistic devices made their way to New York and were seen in such factories as Redwood and Redford.

The second successful American glasshouse was that of the German immigrant, Henry William Stiegel, at his Elizabeth Furnace and Manheim, Pennsylvania works. Stiegel set out to compete with expensive European imports by producing glass of fine quality and design and succeeded so well that many of his wares were indistinguishable from their Continental counterparts. Between 1769 and 1774, the Stiegel works produced glass which was highly sophisticated in design and expertly finished. Items were frequently decorated with enamelled peasant motifs, wheel-engraving, and pattern moldings. The American Revolution, increasing costs, and Stiegel's extravagant way of life eventually drained his funds, causing the closing of the Manheim works.

Another German, John Frederick Amelung, became an important glass manufacturer with the founding of his New Bremen Glass Manufactory near Frederick, Maryland, in 1784. Although the Amelung works operated for only one decade, its clear glass decanters, glasses, and goblets set a high standard. These pieces frequently bore engraved commemorative inscriptions and dates. The shallow wheel-engraving was exuberantly conceived, superbly executed, and unequalled by any other 18th century or early 19th century American glasshouse.

The establishment of glasshouses quite naturally followed the path of civilization, and in 1797, Albert Gallatin founded the New Geneva Glassworks in western Pennsylvania, the first glass factory west of the Allegheny Mountains. The factory operated for 10 years, and its wares are characterized by simple shapes, pale green and yellow colors. Following the lead of Gallatin, many important American glasshouses were founded in the Midwestern area during the opening years of the 19th century. Several were established in Ohio, where the works at Zanesville, Ravenna, Mantua, and Kent produced a variety of wares. These early Ohio glasshouses are characterized by simple bold shapes and a pronounced ribbing.

In the early 19th century many more glasshouses were established, and many continued to prosper. Some, like the New England Glass Company of East Cambridge, Massachusetts (founded 1818) and the Boston and Sandwich Glass Company of Cape Cod (founded 1825), became giants in the field and produced an enormous quantity of objects. Window (or crown) glass and

bottles were the principal early products of these companies, but growing prosperity and refinement in living soon created a market for finer wares, which were produced in every section of the country.

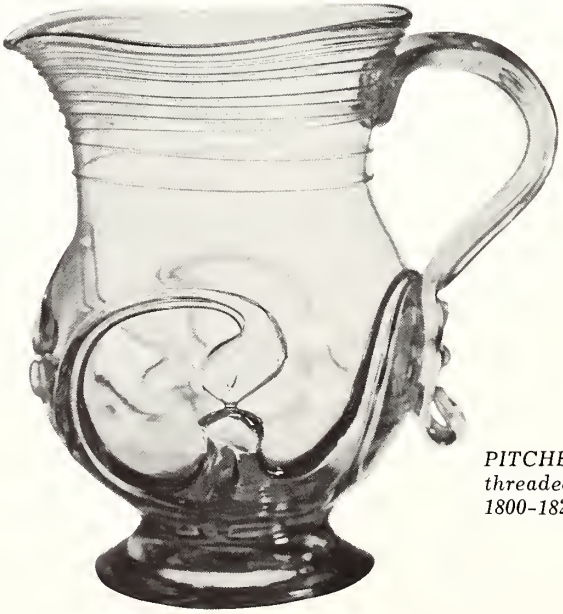
Improvements in glass manufacture were made, among them mechanical pressing, in which the United States took the lead. Although the blowpipe has dominated the history of glass, American inventions in the late 1820's permitted the pressing of a molten mass of glass in a hand-operated mold into elaborately stippled or plain shapes. The stippled wares are today known as "lacy glass" and were produced in both the New England and Midwestern areas. Simple molds, manually pressed together, produced salt cellars and cup plates whose design inexpensively imitated cut glass. This imitative quality also characterized blown three-mold glass, a technique employing a three-part mold connected by hinges to a base. The blower expanded his gather of glass within the closed mold until the glass filled the ridged pattern of the mold; the mold was then opened, and the object was manipulated with tools if further decoration was desired.

Among the most popular of the American mold-blown objects were historical flasks, which were ornamented with political figures, popular slogans, and national heroes. These were originally made to contain liquor and were made throughout the 19th century. The flasks are often amusing evidence of history in the making. In a period of expanding and impassioned nationalism, it is not surprising that flasks bore portraits of national heroes like George Washington, Benjamin Franklin, and the Marquis de Lafayette. The American eagle appears more frequently than any other motif. Masonic emblems and political slogans were often used. The established glasshouses competed for this lucrative market with novel designs and currently popular references.

While these mold-blown and pressed wares were popular in this early period, fine blown and cut wares continued to be produced. The earliest known specimens of American cut glass date from 1771, although there is evidence that cutting may have been practised in this country even earlier. Simple flutes, panels, stars, and plain geometric bands were used extensively. Engraving was also done in this country, the favored motifs being fruit and floral forms as well as classical swags and festoons. Pieces so decorated were hand-polished on wooden wheels so that they have a soft luster which is distinct from the later high-speed wheel polishing or acid bath. Fine cut designs were made by Amelung, the Bakewell Company of Pittsburgh, the New England Glass Company, and the Boston and Sandwich Glass Company.

By 1830, the American glass industry had become so well established that the country no longer needed to depend on imported glass. Consequently, in that year a high Federal tariff was levied on glass from Europe. The Baldwin Bill, passed in that year, called for the collection of port duties and a tariff high enough to limit imports severely. The passage of this act created a boom in American glass manufacture and the subsequent beginning of a true American style.

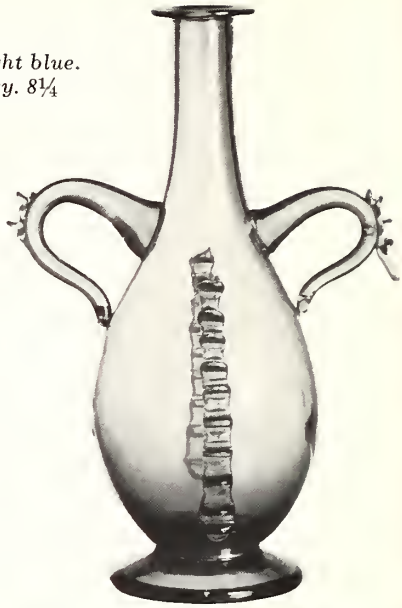
STIEGEL-TYPE GLASS. Attributed to Henry William Stiegel, Manheim, Penn. Mug. Blown, enamelled dove in heart-shaped device and lilies of the valley. 1765–1774. 5¼ inches high. 17.298. Covered Mug. Blown, engraved with cartouche centered by an eagle on a flowering branch. Attributed to Stiegel or the Philadelphia area, about 1759–1775. 10$\frac{5}{16}$ inches high. Gift of Mrs. Harold G. Duckworth. 67.101. Tumbler. Blown, enamelled church and floral sprays. 1765–1774. 4 inches high. 17.300.



PITCHER. Blown, green lilypad decoration, threaded neck, applied handle. South Jersey, about 1800–1825. 7½ inches high. 59.73.

GOBLET. Blown, engraved with "G. F. Mauerhoff" and "New Bremen, State of Maryland, Frederick County, Maryland, 1792," conventionalized floral mantling. New Bremen Glass Manufactory, Frederick, Md., 1792. 7⅛ inches high. 61.2.

VASE. Blown, applied tooled decoration, light blue. South Jersey, late 18th or early 19th century. 8¼ inches high. 17.219.



AMELUNG GLASS. Flask. Expanded mold blown, amethyst, Checkered Diamond pattern. Attributed to New Bremen Glass Manufactory, Frederick, Md., about 1785-1795. 6½ inches high. 59.89. Firing Glasses. Blown, engraved Masonic devices and floral sprays. Attributed to New Bremen Glass Manufactory, Frederick, Md., about 1785-1795. 4 and 4⅛ inches high. 59.43-44. Decanter. Blown, engraved American eagle. Possibly New Bremen Glass Manufactory, Frederick, Md., about 1785-1795. 11⅛ inches high. 59.45.

SUGAR BOWL. Mold-blown, dark blue, "Spiral and Diamond" pattern. Zanesville or Mantua Glass Companies, Ohio, about 1822-1829. 6¾ inches high. Ex-coll: Barber, 17265.

PITCHER. Blown, applied guilloche bands and handle. The New England Glass Company or South Boston Glassworks, about 1820. 6⅜ inches high. Gift of Mrs. Harold G. Duckworth. 64.71.

BLOWN 3-MOLD GLASS. Pitcher. Blown 3-mold, G-IV-7 "Arch" pattern. Attributed to the Boston and Sandwich Glass Company, Sandwich, Mass., about 1825-1835. 7¼ inches high. 59.91. Celery Vase. Blown 3-mold, G-II-18 pattern. Attributed to Coventry Glass Works, Conn., about 1825-1835. 8⅛ inches high. 59.54.

SUGAR BOWL. Expanded mold blown, amethyst. Bakewell, Page, and Bakewell, Pittsburgh, Penn., about 1820-1830. 7⅝ inches high. 48.47.

HISTORIC FLASKS (left to right) All blown in mold. Pint. Olive-obverse: George Washington and "Albany Glass Works, Albany, N.Y." Reverse: Full-rigged railing ship. Albany Glass works, Albany, N.Y., about 1820. 7¼ inches high. Ex-coll: Barber, Philadelphia. 17.368. Pint. Brown. Obverse: Eagle. Reverse: Cornucopia. Perhaps the Keene Glassworks, Keene, New Hampshire, about 1825-1850. 6½ inches high. Ex-coll: Barber, Philadelphia. 17.536. Pint. Aquamarine. Obverse: Railroad engine and "Success to the Railroad." Identical reverse. Lancaster Glassworks, Lancaster, N.Y., about 1850-1870. 6½ inches high. Ex-coll: Barber, Philadelphia. 17.405. Quart. Aquamarine. Obverse: Louis Kossuth and "Louis Kossuth." Reverse: The frigate Mississippi and "U.S. Steam Frigate Mississippi, S. Huffsey." S. Huffsey Glassworks, Philadelphia, Penn., about 1851-1852. 9¼ inches high. Ex-coll: Barber, Philadelphia. 17.438. Pint. Blue. Obverse: Columbia with Phrygian cap, 13 stars, and "Kensington." Reverse: Eagle and "Union Co." Kensington Union Company, Philadelphia, Penn., about 1810. 7⅜ inches high. Ex-coll: Barber, Philadelphia. 17.385. This is a unique example. Pint. Brown. Obverse: Eagle and "Zanesville, Ohio, J. Shepard and Co." Reverse: Masonic Arch and Farmers' Tools. White Glassworks, Zanesville, Ohio, 1823-1838. 6¾ inches high. Ex-coll: Barber, Philadelphia. 17.409.

PITCHER. (South Jersey type). Lily pad Type II, threaded neck, light green glass. New York State, about 1825-1850. Ht. 9¼ inches high, top diameter 6⅜ inches. 59.86.

FOOTED BOWL. Blown, aquamarine, lilypad decoration. Redwood Glass Works, Redwood, N.J., about 1833-1850. Diameter 14⅜ inches. 59.75.

OHIO GLASS (left to right) Bowl. Expanded mold-blown, folded rim, 20 ribs, amber. Kent factory, about 1830. Diameter 9½ inches. 53.167. Flask. Mold-blown, 10 diamond pattern, light amber. Zanesville factory, about 1820. 5¼ inches high. 53.164. Footed Bowl. Expanded mold-blown, 16 ribs, amethyst, folded rim. Mantua Glassworks, about 1830. Diameter 6⅜ inches. 53.165. Flip Glass. Blown, blue. Zanesville factory, about 1830. 7 inches high. 53.166.

PITCHER. Expanded mold blown, clear, applied handle. Pittsburgh area, about 1825-1830. 8 inches high. Ex-coll: McKearin, Hoosick Falls, New York. 59.51.

VASE. Blown, aquamarine, threaded neck and applied handles. New York State, about 1820-1830. 8½ inches high. Ex-coll: McKearin, Hoosick Falls, New York. 48.46.

BOWL. Blown, aquamarine, folded rim. New York, about 1830. 5⅞ inches high. Diameter 10 inches. Gift of J. R. Young. 39.84.

The Middle Period

1830—1880

The new tariff laws of 1830 fostered the rapid development of the American glass industry. These laws made the manufacture of fine tableware especially profitable, and by 1840 there were at least 81 glasshouses in operation. With this new protection from foreign imports and subsequent manufacturing independence came a preference for domestic styles and designs. This, together with increasing prosperity, created a demand for glass items of an enormous variety.

American manufacturers continued to lead the field in the production of lacy and pressed glass, and by 1840 were producing a great quantity of objects, including goblets, vegetable dishes, lamps, trays, and jewel caskets. All of these appeared in a variety of colors and were made in all parts of the country. With the great variety available to the public came an increasing desire on the part of the buyer for novel patterns and shapes. Glasshouses found it necessary to cater more and more to changing modes. This characteristic was to become even more marked in the later years of the century. The public taste for stippled lacy glass had waned by the 1850's although great quantities of the plainer pressed items were made through the 1870's and in lesser quantity throughout the closing years of the century.

COVERED VASE. Blown, ruby flashing over clear; cut in all-over pattern of stars and parallel, intersecting bands. Bohemian style. Attributed to The New England Glass Company, East Cambridge, Mass., about 1845. 29¾ inches high. Gift of Frank W. Gunsaulus. 13.540.

Early pressed glass pieces were of lead glass, an expensive and brilliant metal. However, in West Virginia in 1864, a less costly soda-lime glass was developed. Soon, this cheaper formula was used by almost all of the glasshouses, and only a few were able to maintain the high standards of lead glass. The newer soda-lime glass did not have the ring or rich look of the traditional lead glass, but it was admirably suited to producing the great variety demanded by the public.

With the introduction of the soda-lime formula, the cut glass market was even more threatened than it had been by earlier pressed wares, for now cut glass which could only be made of lead glass had to compete with less expensive pressing methods as well as a cheaper metal. In order to deal with this double threat, those cut glass manufacturers who did not convert to the production of pressed pieces made cut items which could not be duplicated on the pressing machine. Cutting continued the use of the flute, crosshatching, fan, and diamond motifs but used these in greater profusion than the earlier period. At all times, however, the decoration was subordinate to the shape of the glass.

The popularity of engraving reached its zenith during this Middle Period of 1830-1880. The earliest pieces of this era were of clear glass with unpolished engraving, while later Middle Period engraving was used on glass of two colors, such as blue on white or red on white.

Colored cut and engraved glass is essentially a product of this period and may be divided into four types: one color throughout, two or more colors cased (overlaid) together, one color flashed (a thin layer of glass) with another, and glass of one color with a luster stain which is the least desirable since the color results from a chemical staining and not from a coating of actual glass. The Bohemian style, popular from 1840 through the 1860's, was the earliest style in Middle Period cut glass and was usually associated with red over white cased glass decorated with engraved landscapes, hunting scenes, naturalistic motifs, and, occasionally, cutting and faceting in simple overall geometric patterns. Later pieces used more elaborate cuttings, producing elegant effects of contrast.

Favorite engraved patterns were fruit and floral motifs, urns, hunting scenes, and landscapes. While often based on earlier designs, those of the Middle Period were exquisitely detailed. Many of the best engraved designs of this period appeared to be sculptured in relief. Louis Vaupel (about 1812-1903) and Henry Fillebrown of the New England Glass Company were two of the most skilled engravers of the period. Their spectacular and rare work places them in the first rank of Middle Period craftsmen.

The Middle Period also witnessed the production of fine paperweights, both in Europe and the United States. It is appropriate to discuss them as a unit here since the techniques employed were similar, and many of the American examples were based on European prototypes. The earliest weights were probably made in Venice in the early 19th century, although the mosaic pattern called *millefiori,* which was the basis for paperweight design, had been known since Egyptian times. The millefiori patterns were made from multi-colored rods of glass cut into pieces and arranged in a pattern. These were fused together and then dipped in clear glass repeatedly until the desired size was reached, after which the weight was tooled and finished. Almost all paperweight designs are a variation of this technique. France was a leading maker of weights, and many American weights closely follow French designs, while others were too elaborate for the American taste.

By 1870, those manufacturers who had clung to the traditional lead glass standards found that they were facing severe financial difficulty. The popularity of the pressed pattern glass had cut deeply into the luxury market, and the disruptions of the Civil War had done little to promote the need for fine, expensive tablewares. With these problems

came the Panic of 1873, which closed many of the remaining cutting houses. By 1876, the year of the famous Philadelphia Centennial Exhibition, the surviving luxury glass manufacturers realized that nothing short of a massive publicity campaign would save the failing market. Leading houses such as Gillinder and Sons of Philadelphia, the New England Glass Company, the Mount Washington, Boston and Sandwich companies, and Christian Dorflinger of White Mills, Pennsylvania, produced elaborate exhibits which attracted much favorable attention. The displayed wares exhibited a wealth of deep cutting, and patterns were more elaborate than usually seen. The glittering profusion set forth by the troubled glasshouses rekindled public interest in heavily decorated wares and started an unprecedented popularity for cut glass.

PAIR OF CANDLESTICKS. Pressed and tooled. Midwestern area, about 1830-1835. 8½ inches high. Gift of Mrs. Harold G. Duckworth. 66.31.

PITTSBURGH AREA GLASS. Celery Vase. Blown, cut with Strawberry Diamond and Fan motif. Pittsburgh area, about 1835. 7¾ inches high. 59.62. Tumbler. Blown, cut with Strawberry Diamond and Fan motifs; suphide portrait in base, probably of George Clinton. Bakewell, Page, and Bakewell, Pittsburgh, Penn., about 1825-1830. 3½ inches high. 59.53. Footed Bowl. Blown, engraved with floral frieze. Pittsburgh area, about 1825-1840. Diameter 8¼ inches. 59.49. Vase. Expanded mold-blown, threaded lip, engraved festoons. Pittsburgh area, about 1820-1835. 7¾ inches high. 59.47.

CAKE TRAY. Pressed. Attributed to the Boston and Sandwich Glass Company, Sandwich, Mass., about 1835. Length 11¾ inches. Ex-coll: J. H. Rose, Canton, Ohio. 62.12.

LAMP. Pressed, blown, and cut. The New England Glass Company, East Cambridge, Mass., about 1830. 11 15/16 inches high. Gift of S. L. Fillebrown. 49.21. Cut by Joseph Burdakin.

COVERED SWEETMEAT DISH. Pressed, Peacock Eye pattern. Attributed to the Boston and Sandwich Glass Company, Sandwich, Mass., about 1830-1835. 5⅜ inches high. Gift of Mrs. Harold G. Duckworth. 67.46.

LAMP. Blown and pressed opaque white. Probably The New England Glass Company, East Cambridge, Mass., about 1830-1835. 10$^{3}/_{16}$ inches high. Gift of Mrs. Harold G. Duckworth. 69.108.

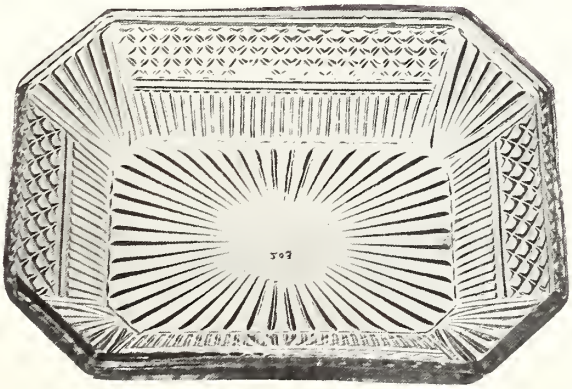
COMPOTE. Pressed, amethyst, Princess Feather Medallion pattern. Attributed to the Boston and Sandwich Glass Company, Sandwich, Mass., about 1835-1840. 6⅛ inches high. Gift of Mrs. Harold G. Duckworth. 68.42.

PAIR OF VASES. Pressed, yellow, Four Printie Block pattern. Probably the Boston and Sandwich Glass Company, Sandwich, Mass., about 1835-1850. 11⅞ inches high. Gift of Mrs. Harold G. Duckworth. 67.122.

COMPOTE. Blown, cut with modified Strawberry Diamond and Fan frieze. Attributed to the Pittsburgh area, about 1840-1850. Diameter 9½ inches. Gift of Mrs. Harold G. Duckworth. 64.67.

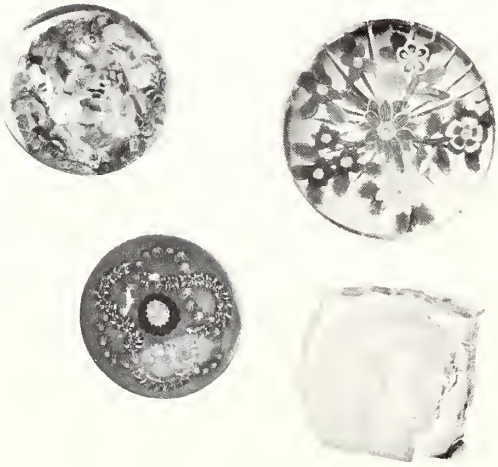
COVERED SUGAR BOWL. Blown, tooled, and threaded. The New England Glass Company, East Cambridge, Mass., about 1840. 9¾ inches high. Ex-coll: McKearin, Hoosick Falls, N.Y.; L. W. Watkins, Middleton, Mass. 53.75.

BOWL. Blown in mold, diamond diapering. The New England Glass Company, East Cambridge, Mass., about 1840. Length 8 inches. Ex-coll: L.W. Watkins, Middleton, Mass. 53.15.



VASE. Blown, cased, ruby over clear and gold flashing; engraved with stag and trees. Bohemian style. The New England Glass Company, East Cambridge, Mass., about 1870-1885. 5⅜ inches high. Gift of Marie W. Greenhalgh in memory of Alice Libbey Walbridge and William S. Walbridge. 58.66.

This vase and its late date illustrate the long-lived popularity of the Bohemian style in this country.



GROUP OF PAPERWEIGHTS, American and European (clockwise from head at bottom) Pressed, acid-finished female head in relief. Made as a souvenir for the World's Columbian Exposition, Chicago, 1893. The Libbey Glass Company, Toledo, Ohio, 1893. Gift of William E. Levis. 51.299. Floral garland on turquoise blue ground. Clichy, France, about 1850. Ex-coll: Barber, Philadelphia. 17.549. Scrambled cane. Attributed to The New England Glass Company, East Cambridge, Mass., about 1865. Ex-coll: Barber, Philadelphia. 17.543. Flat bouquet on spiral latticinio ground. The New England Glass Company, East Cambridge, Mass., about 1850. Ex-coll: Barber, Philadelphia. 17.537. Flat bouquet on red-white jasper ground. St. Louis, France, about 1840. Ex-coll: Barber, Philadelphia. 17.502. Scrambled cane, several canes dated 1852. The New England Glass Company, East Cambridge, Mass., 1852. Ex-coll: Barber, Philadelphia. 17.448. Scrambled, muslin and aventurine. Venice, Italy, about 1845. Ex-coll: Barber, Philadelphia. 17.446. Center: Magnum bouquet, star cut base. Baccarat, France, about 1830-1835. Ex-coll: Barber, Philadelphia. 17.518.

MUG. Blown, threaded, and engraved with "W.W., July 18, 1842." Attributed to The New England Glass Company, East Cambridge, Mass., 1842. 6⅛ inches high. Ex-coll: McKearin, Hoosick Falls, N.Y. 59.48.

PAIR OF LAMPS. Blown fonts and standards on pressed pawed bases. New England area, about 1835-1845. 12 7/16 inches high. Gift of Mrs. Harold G. Duckworth. 67.97.

PITCHER. Blown, cased, amber over clear, engraved with stag and trees. Bohemian style. Attributed to The New England Glass Company, East Cambridge, Mass., or the New York area, about 1840–1860. 14⅞ inches high. 13.545.

NEW ENGLAND AREA LAMPS. (left to right) Pressed, blue font, Single Tulip pattern, green shaft and base. Perhaps the Boston and Sandwich Glass Company, Sandwich, Mass., about 1840-1850. 12 inches high. Gift of Mrs. Harold G. Duckworth. 68.46. Pressed, green font, white shaft and base; both in Acanthus pattern. Acid-finished surface. Perhaps the Boston and Sandwich Glass Company, Sandwich, Mass., about 1840-1850 and possibly later. 11¾ inches high. Gift of Mrs. Harold G. Duckworth. 68.40.

PAIR OF LAMPS. Pressed, canary yellow, Plain Panel fonts on square pedestal and plinth. Perhaps The New England Glass Company, East Cambridge, Mass., about 1847-1861. 10½ inches high. Gift of Mrs. Harold G. Duckworth. 67.105.

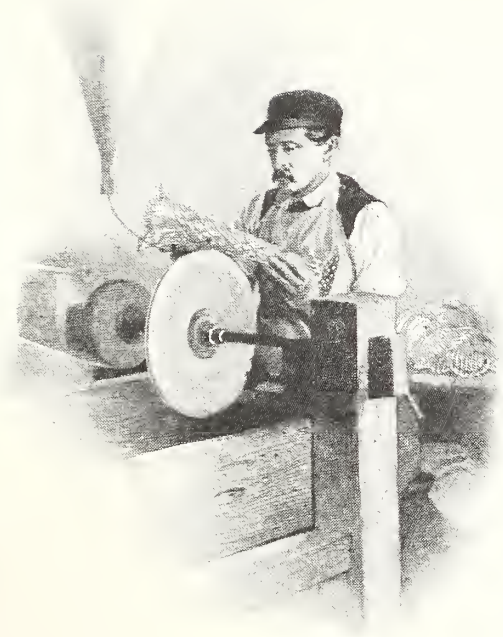
COMPOTE. Pressed, clear and cobalt glass, Fine Diamond pattern with scallops. The Central Glass Company, Wheeling, W. Va., about 1870-1880. Diameter 8⅞ inches. Gift of Mrs. Harold G. Duckworth. 65.74. This compote was also produced in a reversed color scheme.

COMPOTE. Blown, cut in Strawberry Diamond motif with flutes and scallops. The New England Glass Company, East Cambridge, Mass., about 1872–1876. Diameter 8 inches. Ex-coll: Dalton, Somerville, Mass. 59.25.

COVERED SUGAR BOWL. Pressed, Huber pattern; engraved with grape and floral motif. The New England Glass Company, East Cambridge, Mass. 5¾ inches high. Ex-coll: Dalton, Somerville, Mass. 59.28.

DECANTER. Blown, cut, and engraved with, "New Engld. Glass Company. Boston" and "Mass. Genl. Head Qrs." The New England Glass Company, East Cambridge, Mass., 1876. 10⅝ inches high. Ex-coll: McKearin, Hoosick Falls, N.Y. 48.4.

TOILET BOTTLE. Blown, opaque turquoise blue glass, enamelled floral sprays and gold bands. The New England Glass Company, East Cambridge, Mass., about 1875. 4⅞ inches high. Ex-coll: Dalton, Somerville, Mass. 59.31.



The Brilliant Period

1880—1915

Establishment of definite dates for this phase of American glass history is particularly difficult since it is generally associated with cut glass, although a great variety of other types were also made. To further the difficulty, the 1876 Centennial Exhibition really marked the beginning of popular demand for deeply cut ware, although this fashion did not reach its zenith until after Chicago's Columbian Exposition of 1893. Finally, although the heavy cut wares most frequently associated with the period reached their greatest popularity around 1905, their design influence was felt through 1915.

Following the Centennial Exhibition, glasshouses continued to produce the fine-line cuttings and copper-wheel engraving which distinguished the Middle Period. However, by 1880, glass craftsmen designed deep mitre cuttings which were applied to a heavy metal of great brilliance. These decorations became known as brilliant cuttings, and it is these which the average American most frequently thinks of as cut glass. From the beginning, these cut patterns tended to cover most of the surface of the piece they embellished, and after the turn of the century, they tended to increasing elaboration and a subjugation of form to ornament. Favored motifs were the hob-star, fan, notched prism, and single star.

Cut glass had always been expensive because of the labor involved. However, the vogue for overall deep cuttings in the Brilliant Period made it even more costly than before. Its production depended upon the lower production costs of the time and a widespread buying public. During the years from 1880 to 1915, cut glass became a symbol of social prestige. Its opulent surfaces were admirably suited to the formal living patterns of the age. The new prosperity in

PUNCHBOWL AND CUPS. Blown, cut, "Star and Diamond" pattern. The Libbey Glass Company, Toledo, Ohio, 1903-1904. Diameter of bowl 25 inches. Cups 4⅛ inches high. Gift of Owens-Illinois, Inc. 46.27. This set was cut for the 1904 St. Louis World's Fair where it received a Citation of Honor. The bowl was cut by John Rufus Denman (1877-1956), one of the Libbey master cutters.

PLATE. Pressed, opaque white; enamelled cartouche, border and portrait of Henry Wadsworth Longfellow. The New England Glass Company, East Cambridge, Mass., about 1882-1888. Diameter 13 15/16 inches. Ex-coll: E. D. Libbey, Toledo, Ohio. 25.50.

our country created a market sufficient to sustain the high cost of the heavy lead glass and its expensive ornamentation.

Like many other fashions in history, however, the technical virtuosity of brilliant cut glass resulted in its own downfall. The increasing elaboration of pattern produced confused design. This, coupled with a public taste which tired of the ponderous opulence of the glass, began the decline from favor of deeply cut wares. The informality of post-World War I America meant that there was no longer a place for the elaborate sets and complementary pieces of cut glass. Soaring costs of production also worked to inhibit the continued manufacture of this glass. High cost of materials and craftsmanship simply meant that the Brilliant Period cuttings had priced themselves out of existence.

Public demand for novelty of color and form, which had begun in the Middle Period, reached a high point in the Brilliant Period and found expression in the colored art glass so often associated with the late Victorian era. The term art glass has been applied to all of the varicolored decorative wares of the period. As the century drew to a close, increasing attention was paid by all the major companies to exotic effects and finishes rather than to superior form. Some of the effects obtained had undeniable beauty and appeal, while many were simply reflections of a mass taste which would accept anything so long as it was novel.

Many of the exotic colors introduced were the result of careful experimentation by company scientists, and many of the major glasshouses hired men for the sole purpose of devising new coloring. One of the most famous of these technicians was Joseph Locke (1846-1936) who patented art glass for the New England Glass Company. The Mount Washington Glass Company of New Bedford, Massachusetts, and the Hobbs-Brockunier firm of Wheeling, West Virginia, were also important art glass manufacturers.

Art glass was extremely popular in England as well and was made by a number of well-known glasshouses. As had been the case throughout the century, designs and decorations were pirated so that there was frequently a great similarity between English and American pieces. This is quite logical when it is realized that both nations were experiencing economic prosperity and a burgeoning middle class.

The elaborately shaded color effects of this Victorian art glass were often combined with enamelled scenes, figures, birds, and floral motifs. Some were based upon 18th century Rococo design while others were distinctly Victorian in feeling. Other techniques were also used in order to meet the incessant demand for novelty, and these included engraving, mold-blowing, casing, elaborate crimping, and the use of elaborate metal mounts to hold the glass objects.

The most famous American art glass types included Amberina, Pomona, Wild Rose, Agata, and Maize of the New England Glass Company; Burmese, Peach Blow, Crown Milano, and Royal Flemish of the Mount Washington Glass Company; Icicle and Fireglow of the Boston and Sandwich Glass Company; and the late Wave Crest, Kelva, and Nakara of the C. T. Monroe Company.

Although art glass is still manufactured in quantity today, the present production does not exhibit the variety of technique available to the 19th century purchaser. The demand for such wares reached a zenith of production and demand in the closing years of the Victorian era, and this has not since been equalled.

THREE AMBERINA PIECES. The New England Glass Company, East Cambridge, Mass., about 1883-1888. Pitcher. Blown, cut in Russian pattern. 12⅜ inches high. Gift of Miss Dorothy-Lee Jones. 67.14. Vase. Drinking horn shape. Expanded mold-blown, applied domed foot. 7¾ inches high. Gift of Marie W. Greenhalgh in memory of Alice Libbey Walbridge and William S. Walbridge. 58.63. Pitcher. Expanded mold-blown, Thumb Print pattern. 12½ inches high. Gift of Marie W. Greenhalgh in memory of Alice Libbey Walbridge and William S. Walbridge. 58.64.

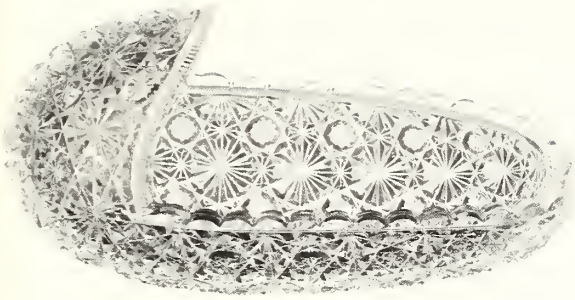
VASE. Amberina, expanded mold-blown. The Libbey Glass Company, Toledo, Ohio, about 1917-1920. 15 inches high. Gift of Owens-Illinois, Inc. 51.55.

This vase is an example of the Amberina wares whose production was briefly revived by the Libbey Glass Company.

POMONA GLASS. The New England Glass Company, East Cambridge, Mass., 1885-1888. (left to right) Creamer. Expanded mold-blown, incised cornflower pattern. 2¾ inches high. Gift of Owens-Illinois, Inc. 51.206. Bowl. Blown, tooled rim, incised cornflower pattern, applied feet. Diameter 5¼ inches. Gift of Marie W. Greenhalgh in memory of Alice Libbey Walbridge and William S. Walbridge. 58.68.

ART GLASS BY JOSEPH LOCKE (1846-1936) Plate. Blown, opaque white glass with enamelled figure of a girl carrying a dog and the legend: "Tiresome Dog." Signed: J. Locke, '92. Diameter 6¼ inches. Gift of William A. Geroe. 51.274. Vase. Blown, cased, opaque white over lavender-ruby; cameo cut with orchid spray, white bands. Attributed to Joseph Locke, The New England Glass Company, East Cambridge, Mass., about 1885. 9 inches high. Gift of Owens-Illinois, Inc. 51.203.

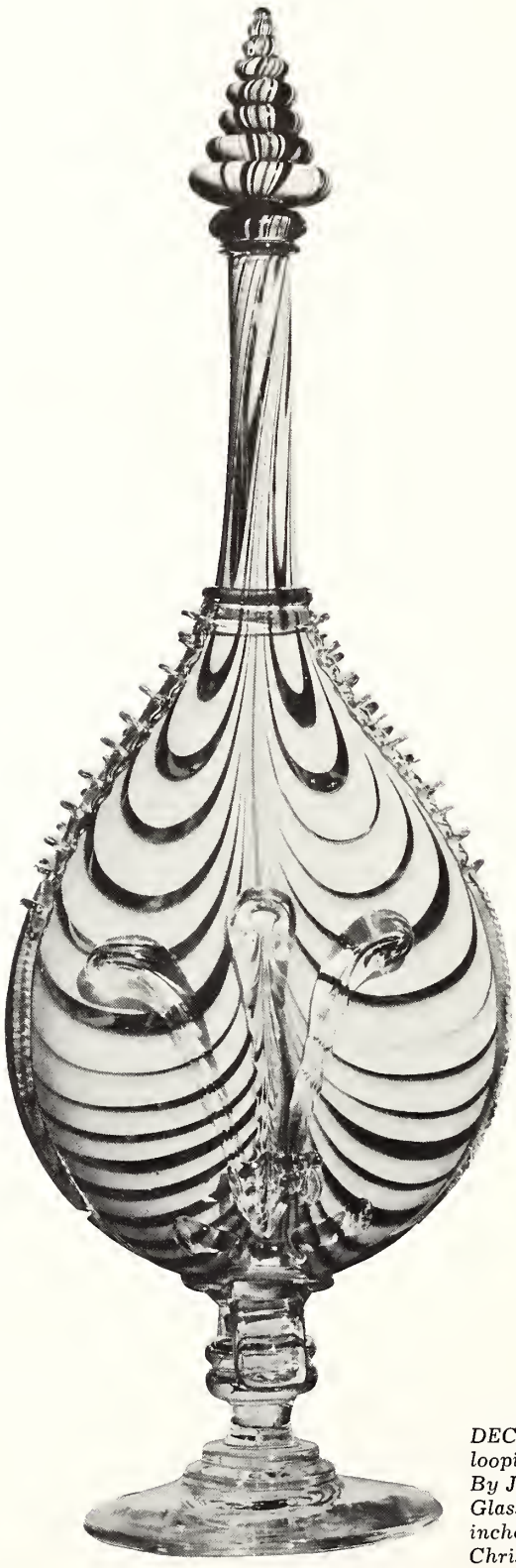
Joseph Locke was an experienced glass technician who was hired by The New England Glass Company in 1883 and patented all of its art glass types until 1889.



CRADLE. Blown and cut, variant Russian pattern. The New England Glass Company, W. L. Libbey and Son, Proprietors, East Cambridge, Mass., about 1886. Length 9 inches. Gift of Mrs. G. A. Morison. 62.33.

Presented by Edward Drummond Libbey to the brother of the donor at his birth. This is an unusual example of Brilliant Period cutting at an early date.

PAIR OF VASES. Peachblow type, blown, opaque, ranging from pale cream to deep rose at rim. The New England Glass Company, East Cambridge, Mass., 1885. 11¼ inches high. Gift of William Donovan through Dorothy Donovan Farrell. 50.284. and 50.285.

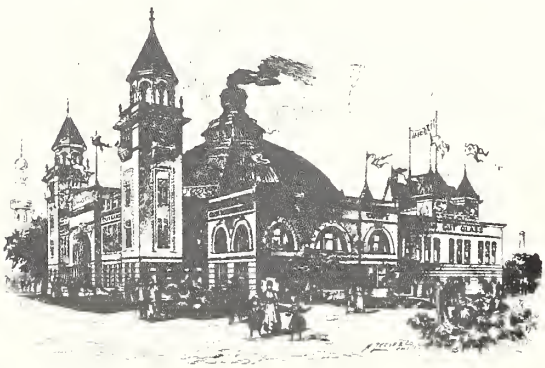


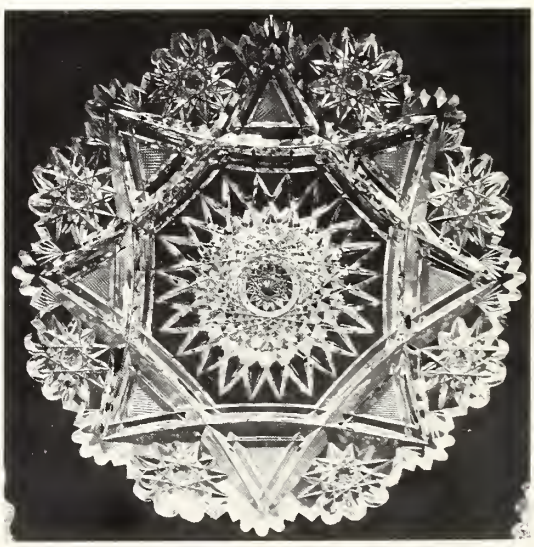
DECANTER. Blown, light rose with opaque white loopings; applied clear glass decoration and foot. By John Liddell, The Mount Washington Glassworks, New Bedford, Mass., about 1885. 19⅞ inches high. Gift of Alexander K. Liddell and Christina Dewar Newth. 54.12.

PAIR OF VASES. Burmese, blown, opaque, ranging from cream to light pink. By John Liddell, The Mount Washington Glassworks, New Bedford, Mass. 15⅜ inches high. Gift of Alexander K. Liddell and Christina Dewar Newth. 54.9.

MAIZE GLASS. The W. L. Libbey and Son Company, East Cambridge, Mass., and Toledo, Ohio, about 1888–1889. (left to right). Vase. Pressed, opaque white with painted green leaves. 6 7/16 inches high. Gift of Mrs. E. M. Belknap. 65.189. Pitcher. Pressed, opaque white with painted blue leaves edged in gold. 8¾ inches high. 68.08.

PUNCH BOWL AND SIX CUPS. Blown and engraved with hunting scenes. The Libbey Glass Company, Toledo, Ohio, perhaps 1892-1893. Bowl 13 13/16 inches high. Cups 3 3/8 inches high. Gift of The Libbey Glass Company, Toledo, Ohio. 15.16. This unique set was awarded a gold medal at the 1893 World's Columbian Exposition in Chicago.





ICE CREAM PLATE. Blown, cut; Kimberly pattern. The Libbey Glass Company, Toledo, Ohio, about 1892. Diameter 7 3/16 inches. Gift of Owens-Illinois, Inc., 51.86.
Kimberly, one of the popular luxury patterns, was named after Charles G. Kimberly, a New Haven dealer in glassware.

FINDLAY ONYX. Dalzell, Gilmore, and Leighton Glass Company, Findlay, Ohio, about 1889. (left to right) Syrup Jug. Mold-blown, opalescent, silver lustre floral decoration, applied handle, metal top. 6¾ inches high. Gift of Mr. and Mrs. Harry S. Bugbee. 64.46. Covered Bowl. Mold-blown, opalescent, silver lustre floral decoration. Diameter 5⅜ inches. Gift of Mr. and Mrs. Harry S. Bugbee. 64.45.

VASE. Crown Milano, blown, opalescent white, polychrome enamel figures and gold decoration, applied handles. The Mount Washington Glass Company, New Bedford, Mass., about 1890. 17½ inches high. Gift of Mrs. Grace R. Miller. 68.70.

TABLE LAMPS. The Libbey Glass Company, Toledo, Ohio. Gift of Owens-Illinois, Inc. (left to right) Blown, cut, Sunburst pattern. This lamp has always been known as "the Nolan lamp" after a blower named C. J. Nolan. About 1900. 40 inches high. 51.3. Blown, cut, Ellsmere pattern. This lamp was made for the 1893 World's Columbian Exposition, Chicago. 33 inches high. 51.2.

PLATE. Blown, cut, and engraved; Sultana pattern in border. Engraved with Libbey sabre trademark of 1896-1906. The Libbey Glass Company, Toledo, Ohio, about 1896. Diameter 12 inches. Gift of Owens-Illinois, Inc. 51.266.

VASE. Blown and cut; pattern of stars, shields, leaf sprays, and ribbons. The Libbey Glass Company, Toledo, Ohio, about 1896-1900. 13 15/16 inches. Gift of Owens-Illinois, Inc. 51.48.

PUNCH BOWL. Blown, cut, pattern similar to Corinthian, The Libbey Glass Company, Toledo, Ohio, about 1900-1902. Diameter 14 inches. Gift of Mr. and Mrs. Edward G. Kirby. 63.38. Known as the "Cresceus Bowl," this piece was presented to Cresceus, a world famous trotting horse owned by George H. Ketcham of Toledo. Cresceus was the holder of several world trotting records.

STEMWARE. The Libbey Glass Company, Toledo, Ohio, 1904. Blown, engraved in overall floral pattern with fleur de lys. Graduated in height from 6 9/16 inches to 3 3/4 inches. Gift of Owens-Illinois, Inc. 69.53-58. A complete set made for the 1904 St. Louis World's Fair.

VASE. Blown, cased, purple over clear; cut and engraved with floral frieze and mitre cuts. The Libbey Glass Company, Toledo, Ohio, about 1900-1910. 10½ inches high. Gift of C. Justus Wilcox. 51.297.

EPERGNE. Blown, cut, and engraved with floral motifs, beaded garlands, and bowknots. The Libbey Glass Company, Toledo, Ohio, about 1902. 20¾ inches high. Gift of Owens-Illinois, Inc. 51.12.

FLOOR LAMP. Blown, cut, variant Corinthian pattern. The Libbey Glass Company, Toledo, Ohio, 1904. 57½ inches high overall. Gift of Owens-Illinois, Inc. 51.4. Designed for the 1904 St. Louis World's Fair.

TABLE. Blown, cut, Neola pattern. The Libbey Glass Company, Toledo, Ohio, 1902. 32 inches high. Gift of Owens-Illinois, Inc. 51.1. A-C.
Probably cut by Libbey's master craftsman, John Rufus Denman, this table was made especially for the 1904 St. Louis World's Fair.

VASE. Blown, cut, Greek Key pattern. The Libbey Glass Company, Toledo, Ohio, about 1907. 11⅝ inches high. Gift of Owens-Illinois, Inc. 51.20.

VASE. Blown, cut in eclectic geometric pattern. The Libbey Glass Company, Toledo, Ohio, about 1903-1905. 23¾ inches high. Gift of Owens-Illinois, Inc. 51.5.

VASE. Blown, cut, and engraved with stags. The Libbey Glass Company, Toledo, Ohio, about 1915. 18⅜ inches high. Gift of Owens-Illinois, Inc. 51.6.

PITCHER. Blown, cut, and engraved in eclectic floral pattern, applied cut handle and foot. The Libbey Glass Company, Toledo, Ohio, about 1915-1920. 14 inches high. Gift of Owens-Illinois, Inc. 51.19.

VASE. Blown, cut with pattern of wheat sheaves, hobstars and facets. The Libbey Glass Company, Toledo, Ohio, about 1910-1915. 18 1/16 inches high. Gift of Dr. and Mrs. Frazier Reams, Sr. 68.13.

MODERN GLASS

1895 to the present

MODERN GLASS (left to right) Bowl. Blown, cased, with mottled pattern; Unica technique. By Andries D. Copier (1901-), N. V. Nederlandsche Glassfabriek, Leerdam, Holland. This piece was made for the 1939 New York World's Fair. 7 9/16 inches high. 1938. 40.40. Vase, Blown, iridescent finish. By Louis Comfort Tiffany (1848-1933). United States, about 1910-1915. 20¼ inches high. Gift of the W. W. Knight heirs. 69.260. Vase. Blown and cased; Graal technique. By Edward Hald (1883-), Orrefors Glassworks, Sweden, about 1930-1935. 8¼ inches high. Gift of Mrs. C. Justus Wilcox. 61.37. Vase. Blown, opaque copper-schmelz glass. By Harvey K. Littleton (1922-), United States, 1966. 6½ inches high. 66.133. "The Camorgue Vase." Blown, with cire perdue *process. By René Lalique (1860-1945), France, about 1935. 11⅜ inches high. Gift of Hugh J. Smith, Jr. 47.43.*

The closing of the 19th century and the early years of the 20th century were marked by the development of an international Art Nouveau style, characterized by sinuous line, floral and vegetable motifs, and soft evanescent coloration. The glass of this style was elegant of outline, although often deliberately distorted, with pale or iridescent surfaces. The Art Nouveau style was an eclectic one, bringing together elements of Japanese art, motifs of ancient cultures, and natural forms. A favored device of the style in glass was an imitation of the nacreous iridescent surface seen on ancient glass which had been buried. Much of the Art Nouveau glass produced during the years of the greatest popularity of the style had been generically termed as "art glass." Art glass was intended for decorative purposes and relied for its effect upon carefully calculated coloristic or technically unusual devices. However, since the Art Nouveau movement was based upon a revolt from the considerably more elaborate "art glass," it would appear more reasonable to view Art Nouveau glass as a distinct category.

France produced a number of outstanding craftsmen, the Daum brothers of Nancy and Emile Gallé (1846-1904) being among the most celebrated practitioners. French work in the new idiom is characterized by complex cameo techniques and subtle shadings. Flowers, leaves, fish, and insects were popular motifs for these beautifully finished pieces. The light, elegant, and continued quality of much Art Nouveau glass was in direct contrast to the weightiness of contemporaneous cut glass.

In the United States, Louis Comfort Tiffany (1848-1933) was the most noted exponent of the style, producing a great variety of forms and surfaces, which were widely copied in their time and are highly prized today. Tiffany was a brilliant designer, suc-

cessfully combining ancient Egyptian, Japanese, and Persian motifs in his designs.

The Art Nouveau style was a major force in the decorative arts from 1895 until 1915, although its waning influence continued through the mid-1920's. However, a new school of thought known as Functionalism had been present since the turn of the century. At first restricted to a small *avant-garde* group of architects and designers, Functionalism emerged as the dominant influence upon design after World War I. The basic tenet of the movement—that function should determine form—was not a new concept, but soon a distinct aesthetic code had evolved. Form should be simple, surfaces plain, and any ornament should be based upon strict geometric relationships. Cubist painting had a strong impact on Functionalist design. This new design concept,coupled with the sharp post-war reactions to the styles and conventions of the preceding decades, created an entirely new public taste. Brilliant cut glass fell from favor as did the pale and lyrical Art Nouveau types. The new taste demanded dramatic effects of contrast, stark outline, and complex but chaste textural surfaces. Much of this glass was cased in red, black, blue, or green, through which simple geometric patterns were cut to reveal the clear glass beneath.

The influence of the great international expositions, which had been considerable in the latter half of the 19th century, continued in the 20th century. The 1925 *Exposition Internationale des Arts Decoratifs et Industriels Modernes,* Paris, was responsible for decided changes in glassmaking. Transparent glass in simple basic shapes was preferred; ornament was sparingly used or was highly formalized. France continued its stylistic leadership, producing such noted designers as Maurice Marinot (1882-1960), Jean Sala (1895-), Francois Décorchemont (1885-), and René Lalique (1860-1945). Other glass producing countries were quick to take up the new style, and the tenets of Functionalism as expressed in the 1920's were applied until the outbreak of World War II.

Glass of the 1930's marked the mature expression of Functionalism in glass; design took on an even more formalized character, with subtle, elaborately textured surfaces. Traditional techniques of cutting and copper-wheel engraving were employed, but they were put to more contemporary effects. Sweden now took the lead in the production of fine glass with such outstanding craftsmen as Simon Gate (1883-1945) and Edward Hald (1883-) of the Orrefors Glassworks, and Elis Bergh (1881-1954) of the Kosta Glassworks. In the United States, Frederick Carder (1863-1963) of the Steuben Glassworks and A. Douglas Nash (1885-1940) of the Libbey Glass Company were distinguished designers, while other beautiful pieces were produced in Europe at such firms as the Leerdam works in Holland.

Glass design of the 1940's reacted against the intricate surfaces and formalization of the preceding decade. Glass of this period tended to be heavy, of great brilliance. Technological advances permitted the manufacture of a glass whose ingredients were chemically pure and perfectly combined mechanically. The sparse decoration was intended to complement the glass itself. Excellent designers existed in Italy, Finland, Sweden and the United States, although World War II seriously hampered or closed production of fine glass for the greater part of this decade.

During the 1950's, glass had begun to follow the trend to abstraction which had already marked much painting and sculpture. Coupled with experiments in form was a

VASE. Blown, cased, and cameo cut; iridescent acid-finished body with lavender iris. By Emile Gallé (1846-1904), France, about 1900. 14½ inches high. Gift of Mr. and Mrs. Hugh J. Smith, Jr. 51.360.

GOBLET. Blown and cased; iridescent orange and clear with green threaded and combed leaves. By Louis Comfort Tiffany (1848-1933), United States, about 1900-1905. 12 inches high. Gift of Mr. and Mrs. Edmund T. Collins. 62.73.

renewed interest in color, which became deep and subtly shaded. Elegance of line was sought for its own sake, and lightness of form was more appreciated. The potential of glass as a sculptural medium was explored as well. In Italy, Paolo Venini (1895-1959) was leading glassmaker in this style, while Scandinavia and other European countries also produced fine examples.

Glass of the present decade has expanded and developed these stylistic traits, the most notable phenomenon being the emergence of a new kind of glass craftsman who is both designer and blower. A leader in this trend was The Toledo Museum of Art, which in 1962 sponsored a pioneering glassblowing seminar, bringing together noted glass craftsmen such as Harvey K. Littleton (1922-), and Dominick Labino (1910-).

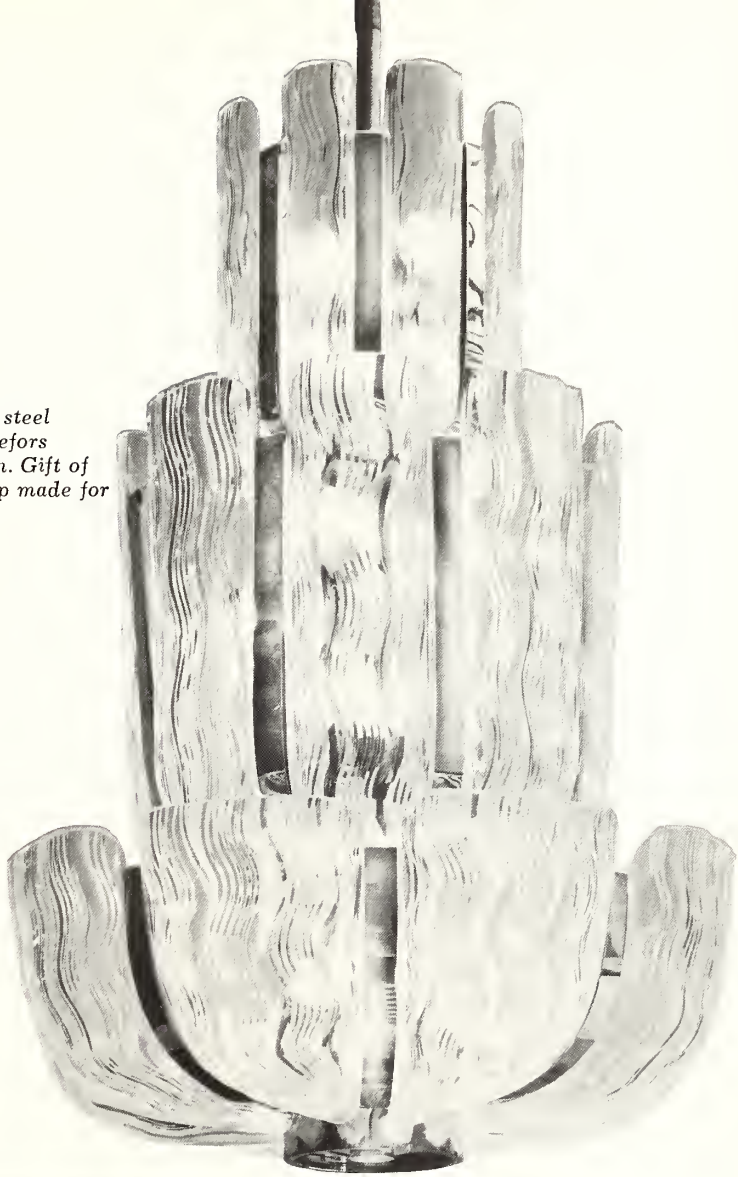
Subsequent seminars at Toledo and elsewhere have proved that glass could be blown outside a factory and have thus prepared the way for an entirely new range of glass experimentation. The United States has been a leader in this development, although the movement has now become international, and the style of the future will undoubtedly be strongly influenced by this latest trend. A new awareness of glass as a material will emerge from these new craftsmen who design as they work.

LALIQUE VASES. Blown, molded, and pressed. By René Lalique (1860-1945), France. (left to right) Grasshopper pattern. About 1920-1925. 11 inches high. Gift of the W. W. Knight heirs. Molded birds at neck and base. About 1920-1925. 12½ inches high. Gift of Hugh J. Smith, Jr. 47.9. Base with molded putti. *About 1925. 10¾ inches high. Gift of Mr. and Mrs. Hugh J. Smith, Jr. 52.137. Opalescent, molded poppies and stems. About 1915. 5⅝ inches high. Gift of Hugh J. Smith, Jr. 48.21. Molded leaf motifs. About 1920-1930. 5¾ inches high. Gift of Mrs. Meyer Rosenfield. 43.60.*

BOWL. Blown in mold, mottled green. By Francois Décorchemont (1885-), France, about 1925. 6⅞ inches high. Gift of Hugh J. Smith, Jr. 49.1.

VASE. Blown, cut. The Baccarat Glassworks, France, about 1930-1935. 8⅞ inches high. Gift of Hugh J. Smith, Jr. 48.3.

PUNCH BOWL AND CUPS. Blown with red prunts. By A. Douglas Nash (1885-1940), The Libbey Glass Company, Toledo, Ohio, 1931-1935. Bowl 7¾ inches high. Cups 3 inches high. Gift of Mrs. Carl R. Megowen in memory of Carl R. Megowen. 68.59.



CHANDELIER. Blown in mold, chrome steel frame. By Simon Gate (1883-1945), Orrefors Glassworks, Sweden, 1935. 47 inches high. Gift of Hugh J. Smith, Jr. 53.161. One of a group made for the Concert Hall, Goteborg, Sweden.

GROUP OF GOBLETS. Blown, cased, cut, and engraved. By A. Douglas Nash (1885-1940), The Libbey Glass Company, Toledo, Ohio, 1931-1935. (left to right) Experimental design. 10¾ inches high. Gift of Owens-Illinois, Inc. 51.155. Buckingham pattern. 9⅜ inches high. Gift of Owens-Illinois, Inc. 51.154. Trafalgar pattern 7½ inches high. Gift of Owens-Illinois, Inc. 51.171. Perhaps an experimental pattern. 9⅞ inches high. Gift of Libbey Glass Company. 35.18. Similar to Venetian pattern. 8⅞ inches high. Gift of Libbey Glass Company. 35.19. Windsor pattern. 10¾ inches high. Gift of Owens-Illinois, Inc. 51.176. Venetian pattern. 8¾ inches high. Gift of Owens-Illinois, Inc. 51.178. Campanille pattern. 9⅛ inches high. Gift of Owens-Illinois, Inc. 51.179. Pompeiian pattern. 10 inches high. Gift of Owens-Illinois, Inc. 51.180.

BOWL. Blown and engraved, cut foot. By Sidney Waugh (1904-), The Steuben Glassworks, Corning, New York, 1935. 7⅜ inches high. Gift of William E. Levis. 36.36.

PLATE. Blown, sandblasted design. By Andreas D. Copier (1901-), N. V. Nederlandsche Glassfabriek, Leerdam, Holland, 1939. Diameter 20¼ inches. 40.39. Made for the 1939 New York World's Fair.

THREE VASES. Modern American Series. By Edwin W. Fuerst (1903-), Owens-Illinois, Inc., Libbey Division, Toledo, Ohio. (left to right) Blown and cut. 8⅞ inches high. Gift of Libbey Glass Company. 43.18. Blown, air-trap feet. 10⅞ inches high. Gift of Owens-Illinois, Inc. 69.38. Expanded mold blown "Spiral Optic" ribs. 9¾ inches high. Gift of Libbey Glass Company. 40.153.

VASE. Blown, cut. By Elis Bergh (1881-1954), Kosta Glassworks, Sweden, 1939. 12⅗ inches high. 40.42.

VASE. Blown, light yellow with blue and black abstractions. By Paolo Venini (1895-1959), Murano, Venice, 1950. 9⅞ inches high. Gift of the Italian Government. 54.49.

VASE. Blown and engraved. By Vicke Lindstrand (1904-), The Orrefors Glassworks, Sweden, about 1950. 10¾ inches high. Gift of Mr. and Mrs. Hugh J. Smith, Jr. 51.359.

VASE. Blown, cased, with gold foil squares. By Toshichi Iwata, Japan, 1956. 8½ inches high. Gift of the artist. 56.54.

"SPHERE WITH PRUNTS." Blown, manganese dioxide glass. By C. Fritz Dreisback (1941-), United States, 1968. 4½ inches high. Gift of the artist. 68.84.

"OBJECTS IN SPACE." Blown, air-trap bubbles, green and amber glass. By Dominick Labino (1910-), United States, 1966. 3¾ inches high. 66.131.

VASE. Blown, fumed iridescence. By Erwin Eisch (1927-), Germany, November 29, 1967. 4 inches high. 68.85.

"PEACE NOW." Blown, sandblasted, copper blue luster; copper-plated arm. By Marvin Lipofsky (1938-), Berkeley, California, 1968. 6 inches high. 68.82.

"BOTTLE BOOGIE." Blown, incised linear pattern, brown, yellow, black. By Joel Philip Myers (1934-), United States. 10¼ inches high. 68.79.

SOME TECHNICAL TERMS

Agate glass. Colored glass fused in patterns resembling the semi-precious stone, agate. Other semi-precious stones were also imitated in glass.

Alabastron. Small, cylindrical flask for unguents or oil. So-called because such vessels were made of alabaster, as well as glass and other materials.

Annealing oven. Oven in which glass is slowly cooled under control to resolve stresses induced in forming. Also called lehr.

Blown Glass. Glass formed by a technique in which hot glass is inflated with air from a pipe by mouth or with a machine.

Blowpipe. The basic tool used in inflating blown glass. Steel tube about four feet long.

Cane. Solid glass rod, often of concentric cased layers.

Casing. Two different parallel colors of glass blown together.

Cristallo. Thin, clear soda-lime glass favored by the Venetians.

Diamond-point engraving. Design incised in the surface of glass with a hard stone point.

Diatreta glass. Term used to designate a small group of glasses from the 4th century A.D. wherein the solid wall of the vessel is surrounded by a basket-like network of interlaced ornaments.

Enamel. Colored vitreous powders painted on the glass in solution and fused there by means of firing for decorative effects.

Facet-cutting. Grinding the surface of the glass in broad planes which are subsequently polished for decorative effect.

Fire polish. Final heating of glass vessel before annealing.

Flashing. Application of a thin layer of opaque or colored glass to the surface of clear glass, or vice versa.

Flint glass. Glass containing a large proportion of lead oxide for high refraction and facility of engraving. Also called lead glass.

Furnace. Enclosure in which the constituents of glass are combined at temperatures of about 2000 degrees F.

Fused. Glass elements heated to the point at which they will adhere to each other but not flow together.

Gather. The mass of molten glass picked up on the end of a blowpipe or pontil from the furnace.

Glory hole. An opening giving access to the hot interior of a reheating furnace for hand working of glass.

Gold-band glass. A variant of ribbon glass employing strips of gold foil fused between transparent glass.

Humpen. Cylindrical drinking vessel usually decorated with enamelled designs; made during the 16th through 18th centuries.

Lathe-turning or lathe-cutting. Shaping a vessel by rotating it against a stationary abrasive surface or edge.

Latticinio. Broadly speaking, the various lace-like techniques combining fine canes of *lattimo* with clear glass.

Lattimo (from the Italian "latte": milk). Opaque, milk-white glass often used in strips.

Lead glass. See flint glass.

Lehr. See annealing oven.

Massive- or mitre-cutting. Deep cutting and forming of designs by abrasion on thick or

solid glass, usually by stone wheels.

Metal. Molten glass; also the material of glass.

Millefiori (Italian: thousand flowers). Technique wherein bundles of multicolored canes are fused, drawn out to a small diameter, and sliced when cool for use as beads, inlays, paperweights, or (when re-fused in molds) for open vessels.

Mold-blown glass. Vessel inflated inside a negative mold.

Pâte-de-verre (French: glass paste). Finely powdered glass softened by heating and pressed into a mold; used to reproduce carved gem cameos.

Pokal. German word for goblet.

Pontil (colloquial "punty"). Metal rod temporarily fused to the bottom of a hot glass vessel for use as a handle during removal of the blowpipe and later forming.

Pressed glass. Object formed by dropping a glob of molten glass between the negative and positive parts of a mold.

Prunt. Blob of glass, sometimes tooled or mold-pressed, applied to vessel for decorative effect.

Ribbon glass. Strips of multicolored glass fused in molds to form vessels.

Roemer. Hollow-stemmed goblet, often of large size, usually decorated with prunts.

Sand-core glass. Vessel formed by application of molten glass over a friable sandy core. Core was scraped out after cooling of completed vessel.

Schwarzlot (German: black lead). Decoration painted in translucent black enamel with details incised through the painting.

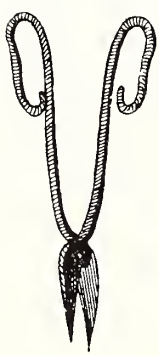
Stained glass. Pieces of translucent colored glass painted with enamel designs and joined by lead bands for use in windows.

Staining. A colored surface produced by chemicals rather than by an actual glass coating. See also casing and flashing.

Stipple-engraving. Pitting the surface of the glass with a hard stone point.

Wheel-engraving. Decoration achieved by grinding glass with an abrasive wheel.

Zwischengold, zwischensilber (German: between gold, between silver). Design in gold or silver leaf enclosed between two precisely fitting glass shapes.



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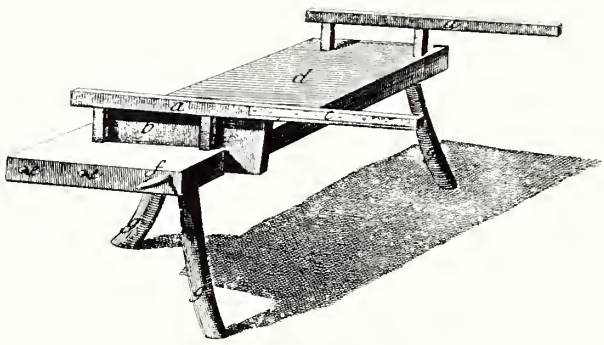
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